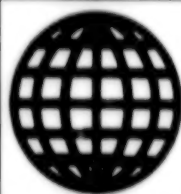


JPRS-ULS-93-010

27 August 1993



**FOREIGN
BROADCAST
INFORMATION
SERVICE**

JPRS Report

Science & Technology

***Central Eurasia:
Life Sciences***

Science & Technology

Central Eurasia: Life Sciences

JPRS-ULS-93-010

CONTENTS

27 August 1993

AGRICULTURAL SCIENCE

- New Wilt Resistant Cotton Strain—Species 1541 *Gossypium Hirsutum* (L.)
[M. Makhbubov, P. D. Usmanov; *IZVESTIYA AKADEMII NAUK RESPUBLIKI TADZHIKISTAN OTDELENIYE BIOLOGICHESKIKH NAUK*, Apr-Jun 92] 1
- Certain Biological Characteristics of the Winter Wheat Variety 'Otrada Severa'
[E. Aliyev, A. V. Ryzhov, et al.; *SIBIRSKIY BIOLOGICHESKIY ZHURNAL*, No 1 93] 1
- Cotton Tissue Crop. Report 4. Isolating, Cultivating and Merging Protoplasts of *Gossypium Hirsutum* and *G. Arboreum*
[N. S. Koroleva, O. Kh. Yuldashev; *IZVESTIYA AKADEMII NAUK RESPUBLIKI TADZHIKISTAN OTDELENIYE BIOLOGICHESKIKH NAUK*, Apr-Jun 92] 1
- Distribution of Stable Organochlorine Compounds in Agricultural Regions. Part 3. Moscow Oblast
[R.V. Galiulin, V.N. Bashkin, et al.; *AGROKHIMIYA*, Apr 93] 1
- Novel Test for Water Pollution Using Duckweed *Lemna minor* L.
[A. G. Lomagin and L. V. Ulyanova; *FIZIOLOGIYA RASTENIY*, Vol 40 No 2, Apr 93] 1
- Fast-Growing Suspension Culture of Timofeyev Wheat Cells and Protoplasts
[S. E. Zorinyants, I. N. Smolenskaya, et al.; *FIZIOLOGIYA RASTENIY*, Vol 40 No 2, Apr 93] 2

BIOCHEMISTRY

- Distribution of Oligonucleotide Derivatives and Their Stability in Mouse Tissues
[V.N. Karamyshev, V.V. Vlasov, et al.; *BIOKHIMIYA*, Apr 93] 3

BIOPHYSICS

- Latrotoxin Channel Blocking by Cadmium Ions
[R. Z. Sabirov, N. A. Yulchibayeva, et al.; *BIOFIZIKA*, No 1, Jan-Feb 93] 4
- Artificial Protein With Predetermined Three-Dimensional Structure and Biological Activity
[D. A. Dolgikh, A. E. Gabrielyan, et al.; *BIOFIZIKA*, No 1, Jan-Feb 93] 4

ENVIRONMENT

- Immunity Indicators in Children With Autoimmune Thyroiditis Living in Territories Exposed to Radioactive Contamination
[I. M. Khmara, L. N. Astakhova, et al.; *IMMUNOLOGIYA*, No 2, Mar-Apr 93] 5
- Scientific Analysis of Problems in Human Immune Status Disorders Due to the Effect of Extreme Factors of the Chernobyl Nuclear Power Plant Accident
[N. O. Artamonova, N. A. Busygina, et al.; *IMMUNOLOGIYA*, No 2, Mar-Apr 93] 5
- Methane Emissions From Southern Marshlands in Western Siberia
[N. S. Panikov, A. A. Titlyanova, et al.; *DOKLADY AKADEMII NAUK*, May 93] 5
- Grain Quality of Winter Wheat Produced on Eroded Chernozem
[V.P. Veretelnikov, V.A. Ryadovoy, et al.; *AGROKHIMIYA*, Apr 93] 5
- Evaluation of the Degree of Pollution of Waters of the Zapadnyy Bug River Basin by Means of Biological Indication
[A.I. Zarubov, G.A. Galkovskaya; *VESTSI AKADEMII NAVUK SERYYA BIYALAGYCHNYKH NAVUK*, No 5-6 92] 6
- Creation of a Soil Zoology Data Bank for Monitoring Purposes
[A.A. Matveyenko, E.I. Khotko; *VESTSI AKADEMII NAVUK SERYYA BIYALAGYCHNYKH NAVUK*, No 5-6 92] 6
- Effect of Radio-Ecological Factors on the Blood Lipid Peroxide Oxidation System
[G.G. Gatsko, L.M. Mazhul, et al.; *VESTSI AKADEMII NAVUK SERYYA BIYALAGYCHNYKH NAVUK*, No 5-6 92] 6
- Investigation of the Specificity of Chemoreception Process Impairments in the Search Behavior Reactions of Model Objects Under the Effect of Different Doses of the Main Classes of Toxicants
[O.V. Zaytseva, V.V. Kovalev, et al.; *SENSORNYE SISTEMY*, No 1, Jan-Feb-Mar 93] 6
- Effect of Neuropeptides on the Interoceptors of the Feline Small Intestine
[L.V. Filippova, G.N. Akoyev, et al.; *SENSORNYE SISTEMY*, No 1, Jan-Feb-Mar 93] 7

EPIDEMIOLOGY

- Investigative Reporter on Russian and U.S. Bacteriological Weapon Programs
[S. Leskov; *IZVESTIYA*, 26 Jun 93] 8

Fleas in the Eastern Kyzyl-Kum and Their Epizootic Significance [A. Ye. Rzhetskaya, L. P. Rapoport, et al.; <i>PARAZITOLOGIYA</i> , No 6, Nov-Dec 91]	12
IMMUNOLOGY	
Production of Recombinant Proteins and Their Use in Immunoblotting [M.R. Farkhutdinov, F.G. Galiullin, et al.; <i>VOPROSY MEDITSINSKOY KHIMII</i> , No 3, May-Jun 93]	13
Oligosaccharide-Binding Molecules of the Surface of Neoplastic Hemopoietic and Lymphoid Human Cells [N.V. Bovin, E.Yu. Korchagina, et al.; <i>EKSPERIMENTALNAYA OKNOLOGIYA</i> , Vol 15 No 2, 93]	13
LASER BIOEFFECTS	
Splenic and Thymic Effects of Low-Intensity Helium-Neon Lasers [P.M. Larionov, G.G. Chasovskikh, et al.; <i>MORFOLOGIYA</i> , Apr 92]	14
MEDICINE	
Electric Stimulation of Diaphragm in Asthmatics [Ye.S. Karashurova, Ye.S. Karashurov; <i>TERAPEVTICHESKIY ARKHIV</i> , Mar 93]	15
EMF Decimeter Band Waves in Combined Management of Early Cerebrovascular Insufficiency [G.A. Leshchinskaya; <i>VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KULTURY</i> , No 2, Mar-Apr 93]	15
Neural Effects of Vasoactive Agent Dimethylphosphine [R.Kh. Khafizyanova, I.A. Studentsova, et al.; <i>KAZANSKIY MEDITSINSKIY ZHURNAL</i> , No 1, Jan-Feb 93]	15
Production Technology and Strength of Porous, Permeable Titanium and Titanium Nickelide Materials for Dental Implant [M.Z. Mirgazitov, M.A. Chobonyan, et al.; <i>KAZANSKIY MEDITSINSKIY ZHURNAL</i> , No 1, Jan-Feb 93]	15
Device for Prevention of Wound Infections [O.S. Kochnev, S.G. Izmailov; <i>KAZANSKIY MEDITSINSKIY ZHURNAL</i> , No 1, Jan-Feb 93]	15
Effect of Synthetic Delta Sleep-Inducing Peptide Analogs on Factors of Antimetastatic Resistance in Mice With Lewis Carcinoma [Yu. P. Shmalko, I. M. Smirnov, et al.; <i>EKSPERIMENTALNAYA ONKOLOGIYA</i> , No 1, Jan-Feb 93]	16
"Vaulen" Enterosorbent Sorption of Enterobacteriaceae Family Bacteria [S. P. Chernov, Yu. M. Grinevich, et al.; <i>VESTNIK BELORUSSKOGO GOSUDARSTVENNOGO UNIVERSITETA. SERIYA 2. KHIMIYA BIOLOGIY</i> , No 2, 92]	16
Microsurgical Transplantation of Vascularized Bone From Human Fetus to Human [N. O. Milanov, S. N. Chaushev, et al.; <i>KHIRURGIYA</i> , Jan 93]	16
Therapeutic Efficacy of Liposomal Form of Cytarabine in Mice With Leukemia [N. M. Fertukova, V. P. Reshchikov, et al.; <i>EKSPERIMENTALNAYA ONKOLOGIYA</i> , No 1, Jan-Feb 93]	16
Radioprotective Action of PAX-Trypsin [A.I. Volozhin, V.I. Pronin, et al.; <i>PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA</i> , No 1, Jan-Feb 93]	17
Adrenergic Mechanisms in Recovery of Oxygen Balance in Shock [A.I. Tyukavin, I.V. Kretser; <i>PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA</i> , No 1, Jan-Feb 93]	17
Sodium and Lithium GABA Salts in Experimental Burn Shock [N.I. Kochetygov, M.I. Remizova, et al.; <i>PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA</i> , No 1, Jan-Feb 93]	17
Cytodifferentiation of Neural Elements of the Spinal Cord and Neocortex of Rats When Implanted in the Peripheral Nerve [E. S. Petrova, E. I. Chumasov; <i>TSITOLOGIYA</i> , No 1 93]	17
Change in Content of Lipids and Biologically Active Substances due to Ultraviolet Irradiation of the Blood in an Experiment With Peritonitis [A. R. Gutnikova, S. S. Abidova; <i>KLINICHNA KHIRURGIYA</i> , No 4 93]	18
NONIONIZING RADIATION EFFECTS	
Response of Atrial Granules to Decimeter Band Electromagnetic Fields Directed at Cardiac and Thyroid Regions [M.S. Geniatulina, Yu.N. Korolev; <i>MORFOLOGIYA</i> , Apr 92]	19
Mechanism of Action of Microwave Resonance Therapy in Infantile Cerebral Paralysis [K.A. Semenova, V.D. Zhukovskiy, et al.; <i>VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KULTURY</i> , No 2, Mar-Apr 93]	19
PHARMACOLOGY, TOXICOLOGY	
Individual Myelopeptide Has a Corrective Effect on Antibody Production in Cases of Adriamycin-Induced Immunodeficiency [S. Yu. Shanurin, S. A. Guryanov, et al.; <i>IMMUNOLOGIYA</i> , No 2, Mar-Apr 93]	20

Evaluation of the Immune Status of Various Groups of Chemical Industry Workers, Using the Matrix Method of Mathematical Analysis [A. V. Kulakov, B. V. Pinegin, et al.; IMMUNOLOGIYA, No 2, Mar-Apr 93]	20
Link Between Radioprotective Activity and Other Biological Effects of Some Carbocyclic Analogues of PGH ₁ [M. B. Golubeva, N. A. Konoplya, et al.; VESTSI AKADEMII NAVUK BELARUSI, SERYYA BIYALAGICHNYKH NAVUK, No 1, 93] NAVUK, No 1, 93]	20
Use of Glucosaminyl Muramyl Dipeptide for Prevention and Treatment of Postoperative Infectious Complications and Pyoseptic Processes in Surgery Patients [T. L. Shchel'syna, A. A. Butakov, et al.; IMMUNOLOGIYA, No 2, Mar-Apr 93]	20
Pattern of Accumulation of Radionuclides in Bream From the Pripyat River [V. V. Yermolayev; VESTSI AKADEMII NAVUK BELARUSI, SERYYA BIYALAGICHNYKH NAVUK, No 1, 93]	21
PHYSIOLOGY	
Involvement of Neuropeptide Y (NPY) and Catecholaminergic Brain Systems in Feeding Behavior [Ye. V. Borisova, T. Kadar; ZHURNAL VYSSHEY NERVNOY DEYATELNOSTI IMENI I.P. PAVLOVA, No 1, Jan-Feb 93]	22
Protective Effect of the FMRFa Endogenous Antagonist of Opioid Receptors During Hypoxic Shock in Rats [I. Yu. Belov, T. V. Mamayeva, et al.; VESTNIK MOSKOVSKOGO UNIVERSITETA: BIOLOGIYA in Russian No 4, Oct-Dec 92]	22
PUBLIC HEALTH	
Problems Associated With Introducing Mandatory Medical Insurance in Russia [V. I. Starodubov; TERAPEVTICHESKIY ARKHIV, No 1, 93]	23
Infectious Diseases in the Russian Federation [V. I. Pokrovskiy; TERAPEVTICHESKIY ARKHIV, No 11 92]	23
Kazakhstan: Medical-Environmental Atlas Published [AZIYA INTERNATIONAL WEEKLY No 16, Apr]	26
Demographic Trends in Kazakhstan [M. Tatimov; ZHAS ALASH, 29 May 93, 3]	28
PSYCHOLOGY	
The Integrality of Individuality and the Effect of Radiation on Activation of the Brain [T. F. Bazylevich, V. G. Aseyev, et al.; PSIKHOLOGICHESKIY ZHURNAL, No 2, Mar-Apr 93]	31
RADIATION BIOLOGY	
Insulin Level Alteration Due to Burns and Combined Radiation Injury and Burns and the Insulating Activity of Medium-Molecular Weight Blood Peptides [V. Ye. Ryabinin, R. I. Lifshits; VOPROSY MEDITSINSKOY KHIMII, No 1, Jan-Feb 93]	32
Estimating the Activity of Acetylcholine Transferase in Cardiac Tissue [S. V. Trishkin, V. A. Kuznetsov, et al.; VOPROSY MEDITSINSKOY KHIMII, No 1, Jan-Feb 93]	32
Activation of Free-Radical Processes as a Factor of Ionizing Radiation-Induced Alterations in Contractile Activity of a Vascular We ¹ [S. M. Tyshkin, V. M. Taranenko, et al.; FIZIOLOGICHESKIY ZHURNAL, No 2-3 93]	33
Intake of Iodine-Containing Water and Radiosensitivity of Rats [Yu. N. Korolev, L. A. Nikulina, et al.; VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KULTURY, No 2, Mar-Apr 93]	33
Condition of Hypothalamo-Hypophyseal-Adrenal Systems in Chernobyl Accident Clean-up Participants With Neurocirculatory Asthenia [A. N. Kovalenko, V. A. Sushko; TERAPEVTICHESKIY ARKHIV, No 2 93]	33
Hematologic Five-Year Follow Up of Chernobyl Cleanup Workers [V. P. Mishchenko, N. N. Gritsay, et al.; GEMATOLOGIYA I TRANSFUZIOLOGIYA, Mar 93]	34
VETERINARY MEDICINE	
Ukrainian Law on Veterinary Medicine [VETERINARIYA, No 1 93]	35
Law of the Republic of Kyrgyzstan on Veterinary Medicine [VETERINARIYA, No 3 93]	41
MISCELLANEOUS	
New Radiopaque Material [G. K. Katrashchuk, Yu. A. Krikun, et al.; KLINICHESKAYA KHIRURGIYA, No 3, 93]	45
Uncoupling of Preganglionic Links and Implantation of Nerve Trunks as a Means of Activating Plasticity of Autonomic Neurons [D. M. Golub, I. I. Novikov; VESTSI AKADEMII NAVUK SERYYA BIYALAGICHNYKH NAVUK, No 5-6 92] 92]	45
Computerized Television Image Processing in Clinical Assessment of Crystalline Lens [G. S. Polunin, A. N. Gurov, et al.; VESTNIK OFTALMOLOGII, No 1, Jan-Feb 93]	45

**New Wilt Resistant Cotton Strain—Species 1541
Gossypium Hirsutum (L.)**

937C0267A Dushanbe IZVESTIYA AKADEMII
NAUK RESPUBLIKI TADZHIKISTAN OTDE-
LENIYE BIOLOGICHESKIKH NAUK in Russian
No 2, Apr-Jun 92 pp 36-40

[Article by M. Makhbubov, P. D. Usmanov; UDC
633.511:575/11 + 632.938.1]

[Abstract] Results are given involving work to create a new variety of upland cotton that is wilt resistant, has improved yield and cotton fiber quality indicators, and is currently undergoing government strain testing. The work was divided into three phases. During phase one 14 hybrid plants were grown. Practically none of them became infected with wilt, meaning that the wilt resistant trait dominated in these plants. Further testing in phase two showed that two wilt resistant genes play a key role in the determination of the trait being researched, and also confirmed that the quality of being wilt resistant is a dominant trait. The third phase involved approving and screening promising material with improved wilt resistance indicators, as compared to other industrial varieties, as well as improved indicators for early ripening, yield and cotton fiber quality. The testing involved comparing the newly obtained hybrid material to the parent forms. One factor affecting the results which were obtained is the fact that the spread of the wilt infection is not even throughout the field, but is located in "hot spots." 4 tables and 10 references.

**Certain Biological Characteristics of the Winter
Wheat Variety 'Otrada Severa'**

937C0253A Novosibirsk SIBIRSKIY
BIOLOGICHESKIY ZHURNAL in Russian No 1, 93
[Signed to press 17 Dec 92] pp 57-63

[Article by E. Aliyev, A. B. Ryzhov, V. A. Sokolov, A. K. Chistyakova; UDC 631.527:633.11.581.15]

[Abstract] A very promising winter wheat named Otrada Severa (joy of the north) is described. This wheat was obtained by a step-by-step process of chemical mutagenesis, followed by screening for winter-hardiness, yield, immunities and other characteristics. In order to evaluate and study this wheat, a competitive test was held to compare it with a regional wheat Albidum 12. A comparative analysis of plant stand productivity, leaf area and sugar content in the two varieties was performed, and the results are presented. Otrada Severa exhibits a very strong response to a naturally short light day, which explains its winter-hardiness. The genetic nature of some morphological characteristics of Otrada Severa is determined. 3 tables and 5 references.

**Cotton Tissue Crop. Report 4. Isolating,
Cultivating and Merging Protoplasts of
Gossypium Hirsutum and *G. Arboreum***

937C0267B Dushanbe IZVESTIYA AKADEMII NAUK
RESPUBLIKI TADZHIKISTAN OTDELENIYE
BIOLOGICHESKIKH NAUK in Russian No 2,
Apr-Jun 1992 [Signed to press 70 Jul 92] pp 41-45

[Article by N. S. Koroleva, O. Kh. Yuldashev; UDC
581.143.6]

[Abstract] Studies whose goal was to optimize the process of isolating and cultivating protoplasts from two types of cotton and inducing them to merge are described. Success in cultivating cotton protoplasts depended on the composition of the medium, the density of the protoplast population, and the origin of the protoplasts. Multicellular colonies for plant tissue protoplasts *G. hirsutum* were obtained. The merging of the *G. hirsutum* and *G. arboreum* protoplasts was induced by using the Power-Chapman small scale procedure. 3 tables and 15 references.

**Distribution of Stable Organochlorine Compounds
in Agricultural Regions. Part 3. Moscow Oblast**

937C0239B Moscow AGROKHIMIYA in Russian No 4,
Mar 93 (manuscript received 28 Sep 92) pp 111-114

[Article by R. V. Galiulin, V. N. Bashkin, R. A. Galiulina, A. T. Levbedev and D. A. Musikayev, Institute of Soil Science and Photosynthesis, Russian Academy of Sciences, Pushchino, Moscow Oblast; UDC 632.95:631.95(470.311)]

[Abstract] Agricultural floodplains, river waters and river mud in the Moscow Oblast were tested for the presence of organochlorine insecticides and PCB as part of ecotoxicologic monitoring. Analysis of the floodplains of 5 rivers (Yakhroma, Istra, Klyazma, Moskva, Oka) showed the following average levels: 2.3 to 22.1 µg/mg hexachlorocyclohexane, 35.5 to 575.7 µg/mg DDT, 9.3-82.7 µg/mg DDE, 2.2-16.1 µg/mg DDD, and 16.2-707.2 µg/mg PCB. The highest and lowest concentrations were generally found in the Yakhroma and Oka floodplains, respectively. Water and river bottom samples confirmed the predominance of DDT over its metabolites, indicating a slow pace of natural degradation of DDT. These findings have to be kept in mind in view of the ongoing agricultural use of these lands. Tables 1; references 9 (Russian).

**Novel Test for Water Pollution Using Duckweed
Lemna minor L.**

937C0237B Moscow FIZIOLOGIYA RASTENIY
in Russian Vol 40 No 2, Apr 93 (manuscript received
27 May 92) pp 327-328

[Article by A. G. Lomagin and L. V. Ulyanova, Botanical Institute imeni V. L. Komarov, Russian Academy of Sciences, St. Petersburg; UDC 581.2.002]

[Abstract] The study shows that the negative phototaxis of chloroplasts in the cells of duckweed leaves can be used as a pollution index for water and aqueous solutions of various toxicants. The toxic effect of water pollution on the duckweed is evidenced by the degree of chloroplast phototaxis suppression. Duckweed leaves were injected with water samples using a glass syringe and put under low light. Phototaxis was studied 17 h later under a 400x magnification microscope. The results showed that in the experimental group 43 percent of the chloroplasts remained in the epistroph position after 10 minute exposure to strong light, as opposed to 5 percent for the control group. These findings show that this is a more sensitive test, indicating the degree of toxicity in water and aqueous solutions. In addition, it is less time-consuming than conventional methods. Tables 1; references 2: 1 Russian, 1 Western.

Fast-Growing Suspension Culture of Timofeyev Wheat Cells and Protoplasts

937C0237A Moscow FIZIOLOGIYA RASTENIY
in Russian Vol 40 No 2, Apr 93 (manuscript received
29 May 92) pp 300-306

[Article by S. E. Zorinyants, I. N. Smolenskaya, and A. V. Nosov; Plant Physiology Institute imeni K. A. Timiryazev, Russian Academy of Sciences, Moscow; UDC 581.1]

[Abstract] The objective of this investigation was to select cultivation conditions that favored rapid growth and proliferation of *Triticum timopheevi* Zhuk and to

develop a technique for isolating protoplasts capable of regenerating the cell wall and dividing. The *T. timopheevi* cell culture suspension was produced from a callus induced from an immature embryo. Various combinations of nutritive media, subcultivation periods, and inoculate volume and the use of physical, chemical, and physiological methods to control the mitotic cycle were employed to increase the mitotic index of the wheat suspension culture. The results showed that a 3.3-fold decrease in the original sowing density of the *T. timopheevi* suspension prompted a two-fold increase in the duration of the logarithmic growth phase, and decreasing the inoculate by an order of magnitude increased the phase 3.5 times. In addition, the study indicated that decreasing the sowing density, increasing the sucrose concentration, and lengthening the cultivation period made it possible to produce a cell population with rapid growth and proliferation activity. Other research revealed that protoplasts could only be obtained from cells in the early stage of the exponent. It is likely that changes in the cell walls and the cell physiologic status during the cultivation cycles affected protoplast viability and yield. In conclusion, the rapid-growing *T. timopheevi* suspension was achieved by optimizing the cultivation conditions. The capacity of this culture to active proliferation and sensitivity to different changes in the cultivation conditions makes it possible to produce a cell population with a considerable degree of synchrony in cell divisions. In addition, the high mitotic activity of the suspension culture makes it a convenient model for cytogenetic research of grains *in vitro*. Figures 4; tables 4; references 22: 2 Russian, 20 Western.

Distribution of Oligonucleotide Derivatives and Their Stability in Mouse Tissues

937C0256A Moscow BIOKHIMIYA in Russian
Vol 58 No 4, Apr 93 (manuscript received 14 Apr 92)
pp 590-598

[Article by V.N. Karamyshev, V.V. Vlasov, D. Zon, Ye.M. Ivanova, and L.A. Yakubov, Bioorganic Chemistry Institute, Siberian Department, Russian Academy of Sciences, Novosibirsk; UDC 577.123]

[Abstract] 5'-[³²P]-labeled oligonucleotides with a benzylamine residue on their 5'-terminal phosphate were used to clarify the behavior of oligonucleotides in mouse tissue. The oligonucleotides pT₁₀, pT₆, pTCTCTCTCTCTCT, and pE (pTGACCCTCTTCCCATC), which are complementary to RNA sequences of the Russian viral tick-borne encephalitis and which have previously been used as antiviral agents in animals and humans infected with encephalitis, served as the starting oligonucleotides. The oligonucleotides were then injected into mice intraperitoneally, subcutaneously, and intravenously in a 200-μl physiological solution. The study animals were killed after set time intervals, after which tissue samples weighing 50 mg were removed from the animals and analyzed on a liquid scintillation counter to

determine their ³²P-radioactivity content. The oligonucleotide derivatives were distributed among all of the organs examined. The highest oligonucleotide concentrations were found in the liver and kidney, and the lowest concentrations were found in the brain. Intravenous and intraperitoneal injection resulted in faster distribution of the oligonucleotides throughout the murine tissues examined than subcutaneous injection did. The hydrolysis rate varied from tissue to tissue, with 5 to 50 percent of intact oligonucleotides remaining 30 minutes after injection. Hydrolysis was found to be independent of the injected dose within a dose range of 0.15 to 150 nmol/mouse. Additional studies were conducted to determine the effect of stability of a 3'-terminal modification of the oligonucleotide. The amino group on the 3'-phosphate did not protect the oligonucleotide from nuclease degradation; however, oligonucleotides with a cholesterol group on the 3'-terminal were found to degrade much more slowly than derivatives with an unprotected 3'-terminal. Phosphorothioate oligonucleotides proved to be much more stable in the bloodstream and in pancreatic tissue than conventional (phosphodiester) oligonucleotides were. A protein that interacts specifically with the oligonucleotides studied was discovered in the liver, kidney, and pancreatic tissue samples examined. Figures 5; references 12: 5 Russian, 7 Western.

Latrotoxin Channel Blocking by Cadmium Ions

937C0258B Moscow BIOFIZIKA in Russian Vol 38
No 1, Jan-Feb 93 (manuscript received 5 Nov 91)
pp 168-171

[Article by R. Z. Sabirov, N. A. Yulchibayeva, and O. V. Krasilnikov; Institute of Physiology, Uzbekistan Academy of Sciences, Tashkent]

[Abstract] The effect of cadmium ions on the current-voltage characteristics of latrotoxin-modified lipid bilayer membranes (LBM) was studied. The LBM was modified with an alpha-toxin from the karakurt spider (*Latrodectus tetricus-guttatus*). It was established that the affinity of cadmium ions for *cis*-orifice channels was significantly greater than for *trans*-orifice pores in all the studied potential ranges (+200 mV). It was shown that latrotoxin channel blocking by cadmium ions could occur by means of a decrease in the negative potential at the entrance to a pore. Figures 3; references 8: 6 Russian, 2 Western.

Artificial Protein With Predetermined Three-Dimensional Structure and Biological Activity

937C0258A Moscow BIOFIZIKA in Russian Vol 38
No 1, Jan-Feb 93 (manuscript received 29 May 92)
pp 67-74

[Article by D. A. Dolgikh, A. E. Gabrielyan, Ye. V. Navolotskaya, V. V. Chemeris, and M. P. Kirpichnikov;

Institute of Molecular Biology, Russian Academy of Sciences, Moscow; Institute for Protein, Russian Academy of Sciences, Pushchino, Moskovskaya Oblast; Institute of Immunology of the State Concern "Biopreparat" [Biological Preparations], Lyubuchany, Moskovskaya Oblast]

[Abstract] The design and production of artificial proteins (or *de novo* proteins) are some of the most interesting prospective problems in protein engineering. In this work, the biologically active fragment 131-138 of human α_2 interferon, which activates thymocyte blast-transformation in mice, was incorporated by genetic engineering methods into albebetin in order to produce an artificial protein with a predetermined three-dimensional structure of the type $\alpha\beta\alpha\beta\beta$ (two α -helices lying on the β -plate). The albebetin gene incorporating the segment corresponding to the interferon fragment was expressed in a wheat germ cell-free translation system. The general structural characteristics and biological properties of the obtained protein were studied. It was shown that albebetin with the interferon fragment had a compact and relatively stable structure, it exhibited a high affinity to mouse thymocyte surface receptors, and it activated the thymocyte blast-transformation reaction at concentrations on the order of 10^{-11} M. Figures 4; references 17: 2 Russian, 15 Western.

Immunity Indicators in Children With Autoimmune Thyroiditis Living in Territories Exposed to Radioactive Contamination

937C0252D Moscow IMMUNOLOGIYA in Russian No 2, Mar-Apr 93 (manuscript received 15 Apr 92) pp 56-58

[Article by I. M. Khmara, L. N. Astakhova, L. L. Leonova, T. V. Vorontsova, N. N. Galitskaya, O. I. Dudarenko, and Ye. V. Shemyakina; Scientific Research Institute (NII) of Nuclear Medicine, Belorussian Ministry of Public Health, Minsk; UDC 616.441-002-053.2-092:612.017.1]-02:614.876-07]

[Abstract] The role of immune disorders in the pathogenesis of thyroid gland diseases is well known. A number of authors have indicated the effect of small doses of ionizing radiation on the status of the immune and thyroid systems. In this work, the authors studied the status of cellular and hormonal immunity in 84 children (7-14 yrs. old) with autoimmune thyroiditis (AIT) living in Gomelskaya Oblast regions (43 were from Khoynikskiy, Braginskii, and Narovlyanskii Rayons) exposed to radioactive contamination, 10 children with AIT from "clean" territories, and 15 children without thyroid system disorders from the regions with radioactive contamination. The study was begun 4.5 years after the Chernobyl Nuclear Power Plant accident. Results were compared with data from a study of healthy children from "clean" regions in Belorussia. Depression of cellular immunity and in the activation of humoral components of the immune system were identified in children with AIT. There was a direct correlation between the dose of radiation from radioactive iodine absorbed by the thyroid gland and the content of T-lymphocyte subpopulations. References 8: 6 Russian, 2 Western.

Scientific Analysis of Problems in Human Immune Status Disorders Due to the Effect of Extreme Factors of the Chernobyl Nuclear Power Plant Accident

937C0252E Moscow IMMUNOLOGIYA in Russian No 2, Mar-Apr 93 (manuscript received 3 Mar 92) pp 58-60

[Article by N. O. Artamonova, N. A. Busygina, and V. I. Gubskiy; Kharkov Scientific Research Institute (NII) of Medical Radiology, Ukrainian Ministry of Public Health; UDC 616-092:612.017.1]-02:614.876]-07]

[Abstract] The goal of this study was to analyze publications on the effect of extreme factors of the Chernobyl accident on the human immune and health status. An analysis of 118 domestic publications allowed the authors to systematize the information available to them and to present it in the form of an informational model. The top block of the model was labeled, "Functional and morphological alterations in the immune system (118 publications)." That block was broken down into three more blocks: 1) new methods for researching the immune status (8 publications), 2) study of secondary

immune deficiency and development of various pathological disorders (101), and 3) methods for treating immunological pathologies (15). Block 2 was further broken down: 1) adult population (82) and 2) child population (27). Publications on the adult and child populations were further broken down: 1) pathology of gastrointestinal tract organs and the liver (adult 13.3%, child 21.2%), 2) endocrinopathy (adult 20.0%, child 21.2%), 3) changes in the microflora of the skin and infectious diseases (adult 28.9%, child 15.2%), 4) acute radiation sickness (ARS) (adult 13.3%), 5) pathology of the thyroid gland (child 15.2%), and 6) other disorders (adult 24.5%, child 27.2%). Analysis of the collected mass of data has provided for determination of research directions in studying problems, major breakthroughs in studying the effects of the Chernobyl accident on the population's health, and characterization of a methodical approach to conducting research and determining its most promising directions. Figures 1; references: 30 Russian.

Methane Emissions From Southern Marshlands in Western Siberia

937C0284A Moscow DOKLADY AKADEMII NAUK in Russian Vol 330, No 5 May 93 [Signed to press 5 May 93] pp 388-390

[Article by N. S. Panikov, A. A. Titlyanova, M. V. Paleyeva, A. M. Semyenov, N. P. Mironycheva-Tokareva, V. I. Makarov, Ye. V. Dubinin, S. P. Yefremov; UDC 576.8.095.323.5]

[Abstract] It has been difficult to accurately assess the amount of methane coming from non-man-made sources, since no attempt has been made to date to directly measure methane emissions from the most extensive marshes on dry land, which are primarily the marshes of the Western Siberian lowlands. In order to fill in the gaps in this knowledge, field research was conducted on methane emissions and associated indicators in six marsh ecosystems which encompass the most important types of marshes typical for the Vasyugan and Ket-Chulym marshy peat regions. The chamber statistical method was used to determine methane emissions. The results of the testing are given. It was found that there are three factors which can cause variations in methane emissions by more than 50%. On the basis of the results, the yearly flow of methane into the atmosphere from the marshes of Western Siberia is estimated. The calculations correspond to research conducted in Canadian swamps where micrometeorological methods were used. Table 1, figures 3, references 10: 5 Russian and 5 Western.

Grain Quality of Winter Wheat Produced on Eroded Chernozem

937C0239B Moscow AGROKHIMIYA in Russian No 4, Mar 93 (manuscript received 10 Dec 91) pp 29-35

[Article by V.P. Veretelnikov, V.A. Ryadovoy, N.S. Radchenko and I.A. Panchenko, "Elita" Scientific Production Association, Sumy, Ukraine; UDC 631.8:631.51:631.452:631.445.4:633.11"-324"]

[Abstract] The quality of Okhtyrchanka winter wheat grain was assessed in 1988-1990 in relation to cultivation conditions on eroded chernozem. The fundamental findings were that grain quality was not significantly related to preceding crops (barley-buckwheat-winter wheat or barley-peas-winter wheat rotations), cultivation technology, fertilization dosages, or yields. Protein content of the grain remained below the norm for Okhtyrchanka grown on eroded soils, but was improved by fertilizer (N90P90K90 vs. N60P60K60), preceding crops (peas vs. buckwheat) and plowing technique. In general, baking qualities of the flour—despite reduced protein levels—was satisfactory with high volume indicators (631 ml). Tables 1; references 13 (Russian).

Evaluation of the Degree of Pollution of Waters of the Zapadnyy Bug River Basin by Means of Biological Indication

937C0279D Minsk VESTSI AKADEMII NAVUK
SERYYA BIYALAGYCHNYKH NAVUK in Russian
No 5-6, 92 (Signed to press 17 Nov 92) p 128

[Abstract of article by A. I. Zarubov, G. A. Galkovskaya and A. M. Samusenko, UDC 574.635.574.583(282.243.613)]

[Text] The degree of pollution of waters of the Zapadnyy Bug River and its tributaries was evaluated for the first time on the basis of indicator organisms. It was established that the Zapadnyy Bug and Mukhavets rivers are categorized as β -mesosaprobic water basins, while the Lesnaya and Pulva rivers are β -meso-oligosaprobic water basins. It is revealed that population centers situated along riverbanks do not have a significant influence on formation of zooplankton communities.

One table, 1 figure, 5 bibliographic references.

COPYRIGHT: Vydavetstva "Navuka i tekhnika". Vestsi AN Belarusi, seryya biyalagychnykh navuk 1993

Creation of a Soil Zoology Data Bank for Monitoring Purposes

937C0279C Minsk VESTSI AKADEMII NAVUK
SERYYA BIYALAGYCHNYKH NAVUK in Russian
No 5-6, 92 p 128

[Abstract of article by A. A. Matveyenko and E. I. Khotko, UDC 631.467/468:681.3.016]

[Text] An experiment was conducted for the first time to create a computer data bank on soil invertebrates. It is shown that the first data accumulation and storage block contains taxonomic, geographical and ecological data on soil animals, and the second contains their quantitative characteristics, indicator properties and descriptions of the influence of anthropogenic factors upon the zoocenotic indicators of their communities. In view of high sensitivity to environmental pollution and their great practical significance in soil-forming processes, soil coleopteran and armored mites are recommended as

priority objects of monitoring. The advantages of the proposed system are singled out.

COPYRIGHT: Vydavetstva "Navuka i tekhnika". Vestsi AN Belarusi, seryya biyalagychnykh navuk 1993

Effect of Radio-Ecological Factors on the Blood Lipid Peroxide Oxidation System

937C0279A Minsk VESTSI AKADEMII NAVUK
SERYYA BIYALAGYCHNYKH NAVUK in Russian
No 5-6, 92 p 127

[Abstract of article by G. G. Gatsko, L. M. Mazhul, V. Ye. Volykhina and I. I. Krylova, UDC 577.391.547.915.511.111]

[Text] The state of the blood lipid peroxide oxidation system of rats maintained for 5 months in regions subjected to radionuclide contamination was studied. Changes in the functional state of this system are established. The revealed changes are less pronounced on the backdrop of preliminary administration of ^{131}I .

Three figures, 9 bibliographic references.

COPYRIGHT: Vydavetstva "Navuka i tekhnika". Vestsi AN Belarusi, seryya biyalagychnykh navuk 1993

Investigation of the Specificity of Chemoreception Process Impairments in the Search Behavior Reactions of Model Objects Under the Effect of Different Doses of the Main Classes of Toxicants

937C0233A Moscow SENSORNYE SISTEMY
in Russian Vol 7 No 1, Jan-Feb-Mar 93 (manuscript received 25 Nov 92) pp 5-8

[Article by O.V. Zaytseva, V.V. Kovalev, and N.Ye. Shuvalova, Physiology Scientific Research Institute imeni A.A. Ukhtomskiy, Saint Petersburg University, Saint Petersburg; UDC 612.86 + 612.87:594.3]

[Abstract] Young (2- to 3-month-old) specimens of the gastropod mollusk *Ampullaria gigas* with shell diameters of 1.5 to 2 cm were studied under laboratory conditions to determine the sensitivity of their olfactory and taste systems to solutions of CuSO_4 , NaF , LiCl , NaNO_3 , phenol, and Lindane in concentrations ranging from 0.1 to 1,000 times the maximum permissible concentration of toxicant (MPC_{tox}). The study animals were held in a standard vessel containing one and the same volumes of different concentrations of the study toxicants for 48 hours at a temperature of 25°C. Control animals were held in water used to find and contain the mollusks. Nine mollusks were used to evaluate the effects of each of the concentrations of study toxicants investigated. After the study 48-hour holding period had elapsed, the study animals were removed to pure water a specified distance from a standard food bait, and their efficiency of locating and capturing the food bait was determined. The results were processed and plotted in the form of dose dependency graphs. Specimens of *A. gigas* that have

not been exposed to a toxicant typically require 180 to 200 seconds to locate a food bait and another 60 to 80 seconds to capture the bait. After 48 hours of exposure to solutions of various toxicants, the study mollusks required more time to both locate and capture food baits. The times required for both stages of the mollusks' food recovery process increased as the toxicant concentration increased. The first stage of the food recovery process (i.e., location of the food bait) was less affected by exposure to toxicant than the second stage was. Lithium and phenol in concentrations to 100 times the MPC_{tox} did not significantly increase the time required to capture the bait; however, concentrations of lithium and nitrates in amounts equal to 1 to 2 times the MPC_{tox} and copper in amounts 10 times the MPC_{tox} resulted in sharp increases in the duration of the food capture stage. Lithium and copper (in concentrations up to 100 times the MPC_{tox}) increased the time required for the toxicant-exposed mollusks to capture the food bait by a factor of 5-6 as compared with the time required by the control mollusks. The time required to locate the food bait after exposure to the said toxicants only increased by a factor of 1.3-1.5, however. This change in the study of mollusks' food location and capture behavior was associated with the distribution of individual receptor and epithelial cells in the tentacles and lips of the exposed mollusks. Figure 1; references 6: 4 Russian, 2 Western.

Effect of Neuropeptides on the Interoceptors of the Feline Small Intestine

937C0233B Moscow: *SENSORNYE SISTEMY*
in Russian Vol 7 No 1, Jan-Feb-Mar 93 (manuscript
received 25 Feb 92) pp 27-29

[Article by L.V. Filippova, G.N. Akoyev, and N.O. Sherman, Physiology Institute imeni I.P. Pavlov, Russian Academy of Sciences, Saint Petersburg; UDC 612.893]

[Abstract] A study examined the effect of intra-arterial injections of dalargin on the evoked activity of the Pacinian corpuscles of the mesentery of the feline small intestine. Fifteen cats were anesthetized with 1.1 mg/kg hexenal, after which a loop of their small intestine was placed in a thermostatted bath filled with warm (38°C) Locke-Ringer's solution and fastened on a special platform. Next, a quantity of 0.5 ml Ringer's solution that had been predosed with 10, 20, 30, 40, or 50 µg dalargin was injected into the central end of one of the branches of the mesenteric artery a distance of about 10-15 mm from the intestinal wall. Conventional silver electrodes and an N-338 6 P automatic recording device were used to record the resultant pulse activity. Mechanical stimulus was applied at least three times prior to the dalargin injections and then 1, 2, 3, and 10 minutes after injection. The study results were subjected to statistical processing, and their reliability was determined in accordance with the Student's t-test ($P < 0.05$). The experiments demonstrated that all of the dalargin doses studied suppress the pulse activity of the Pacinian corpuscles. In isolated instances, however, a small increase in the receptors' evoked responses was observed after an injection of dalargin. These increases were associated with the different starting functional states of the smooth musculature of the intestine. The most significant effects were observed at dalargin doses of 30 to 40 µg. Further increases of the dose to 50 µg led to a decrease in the distinctness of the evoked effects. It was hypothesized that dalargin's suppressing effect on the evoked activity of the Pacinian corpuscles may result directly from its action on the receptor membrane of the Pacinian corpuscles, may occur indirectly (i.e., as a result of the changes that dalargin causes in the tonus of the intestine's smooth musculature), or else may result from a combination of these direct and indirect effects. Figure 1; references 6: 5 Russian, 1 Western.

Investigative Reporter on Russian and U.S. Bacteriological Weapon Programs

93A30072A Moscow IZVESTIYA in Russian 26 Jun 93 p 15

[Article by Sergey Leskov: "Plague and the Bomb: Russian and U.S. Military Bacteriological Programs Are Being Developed in Deep Secrecy, and Present a Terrible Danger to the World"]

[Text] If you drove with your eyes closed through Fort Dietrich, a dull, unassuming town in the state of Maryland, you wouldn't miss a thing. It is typical small-town America, where police in [one word illegible] Chevies wake up only to lazily chew another hamburger. It would be impossible for the casual observer to guess that here in the middle of nowhere, great things that are the object of endless disputes among the leaders of the superpowers are happening.

It is here in Fort Dietrich, deep within a closed zone, that the Military Medical Research Institute of Infectious Diseases is located. It is the Pentagon's head organization in the bacteriological weapons program, and it absorbs around 70 percent of the federal budget allocations for such research. In the 1980s Fort Dietrich was mentioned in many sensational articles as the place where AIDS, which is now assaulting the planet, was developed in test tubes. And although this version has not proven itself to be true, the institute continues to enjoy dubious glory.

It is extremely difficult to get into the institute: It took several weeks for the Russian embassy, the U.S. State Department and the U.S. Defense Department to sort out my identity. As bureaucratic logic would have it, it was of particular significance that this IZVESTIYA correspondent was representing an independent publication not associated with any official organizations. So it was that I became the first Russian (and Soviet) journalist to receive permission to visit this top secret Pentagon facility.

I had been gathering materials on bacteriological weapons for several years. Of all the forms of mass destruction weapons, they can be considered to be the most mysterious. Not just because bacteriological weapons remain the only ones about the combat application of which dependable information is unavailable. Owing to the very nature of the subtle biological processes occurring, the true goals of many projects in this area remain a mystery even to the best experts. My investigation was aided by support from the MacArthur Foundation—I was able to visit many American organizations, and meet with specialists studying this problem. A comparison of military bacteriological programs of the two countries permits the conclusion that given all of the differences, they are similar in one most important thing: Neither Russia nor the USA offers any guarantees today of observance of international agreements regarding this form of mass destruction weapons.

AIDS Is Just Kids Stuff

The first thing to strike you in Fort Dietrich is the large number of young, well-built men dressed in hospital smocks. The institute director, Colonel Ernest Takafuji, told me that these men were American army soldiers serving as volunteers in tests of new bacteriological preparations. What is interesting is that according to law, all forms of material stimulation, be they money or extra leave, are categorically prohibited. Before being tested on people, the preparations are tested on rats and monkeys, but the American Society for Prevention of Cruelty to Animals requires a strict accounting of each animal used. Colonel Takafuji, who also possesses the academic degrees of Doctor of Medicine and Doctor of Philosophy, is personally responsible for the health of his personnel.

When it comes to AIDS, Colonel Takafuji is disparaging on the subject. The military feel that this disease has no tactical value. First of all the incubation period is too long. And second, although the means by which the infection is spread might be enjoyable, it is very unreliable, and it yields easily to prevention. The diseases they are studying in Fort Dietrich are distinguished by high combat effectiveness—tularemia, Venezuelan encephalomyelitis, anthrax, and various fevers and toxins.

In an interview with me, Major General Valentin Yevstigneyev, the director of the corresponding direction in the Russian Ministry of Defense, listed absolutely the same diseases as Colonel Ernest Takafuji as being the most dangerous in terms of starting an epidemic. At the same time, there is information that under a veil of secrecy, military biologists have been studying fundamentally new preparations for which there are no vaccines today. As an example they are studying the venom of Mexican spiders in the USA, and some variants of plague in Russia. It is impossible to check this information through official channels.

As far as delivery systems and means of employment of bacteriological weapons are concerned, even here Russian and American specialists agree today. The sabotage and exotic methods that figured into spy movies and which were tested in the 1940s, such as poisoning water basins or parachuting plague-carrying rats, were recognized to be ineffective. Atomization of dry aerosols in air is the most dangerous, since aerosols can be produced by means of systems developed for chemical weapons—conventional missiles and airplanes.

The Wind Rose Gives Its Readings

When the discussion turns to bacteriological weapons, most of us recall the tragedy in Sverdlovsk in 1979, when 69 persons died as a result of the release of anthrax virus from a military laboratory. Evidence of the destructive power of bacteriological weapons can be found in the fact that victims died 24 hours after infection. When highly placed Russian executives recently admitted to the causes of the tragedy, Western specialists believe that they were clearly not telling the whole story. It is not

even clear whether the virus that entered the air was from a weapon or a therapeutic vaccine. In the meantime the truth about this incident is extremely important, though hardly in terms of trying and convicting some officials after so many years. This release remains the sole incident of such a large scale, and its study is required chiefly by science, so that if such events recur, medical personnel could act with the greatest effectiveness.

In the absence of clear information, it is hard to dispute the opinion of the chairman of the state commission working in Sverdlovsk, Lieutenant General Petr Burgasov, with whom I spoke in his huge apartment in a building reserved for the Soviet establishment on Kotelnicheskaya Quay. The general continues to insist today that the cause of the epidemic lay not in the release of military aerosols but infection of the population by poisoned meat.

In Harvard University I met with Professor Matte Meselson [transliteration], who is apparently the sole specialist who subjected the Sverdlovsk epidemic to strict scientific analysis. In particular Professor Meselson drew up a wind rose for the period of the epidemic. His conclusion is that most of the victims resided strictly in the direction of the wind on the day of infection. At the same time the professor cannot explain why there were no children or adolescents among the victims. If they were still sleeping in their rooms in the early hour, the probability of infection in a closed space should have been even higher, Matte Meselson believes.

There is one other question that leaves no one indifferent. Is it really possible that Yeltsin, who was the oblast party committee leader, was ignorant of the real causes of the epidemic back then? This is not at all an idle question. If Yeltsin had known everything before, but remained silent, then how sincerely can we take his promises to henceforth observe international agreements? I have heard many stories regarding this. One of them was this: Whenever General Burgasov telephoned Andropov in Moscow on the government line, Yeltsin had to leave Andropov's office.

In any case Western specialists know far from everything about all of the incidents of this sort in the former USSR. As an example in the early 1980s a brucellosis bacterium leak occurred in the Moscow Scientific-Control Veterinary Institute. A wind gust carried the bacteria into the backyard of the Higher Party School, where nomenklatura workers undergoing advanced training were taking a smoke break. As a result around 15 persons wound up in the resuscitation ward. However, because of the unique nature of the victims, it was possible to maintain secrecy over the incident.

Of course it would be unjust to say that accidents have occurred only in the USSR. In the 1950s, cases of infection of personnel by anthrax with a lethal outcome were recorded at Fort Dietrich as well. And in 1968, 64,000 sheep died as a result of a toxin leak at a proving

ground in Daguz [transliteration]. Like in Sverdlovsk, the military denied their role in the incident. In the mid-1970s New York subway passengers were subjected to anti-influenza vaccination by aerosols with the complicity of military biologists, as a result of which dozens of people fell seriously ill.

Microbes Are Above the Law

"We are presently conducting research exclusively for defensive purposes," Colonel E. Takafuji insistently repeated this thought in another context. "We are not creating any kind of substances that could be used for offensive purposes. On the contrary vaccines are being developed for the benefit of all mankind."

I heard statements just as sincere and disarming on many occasions from Russian specialists as well. But one of the mysteries of bacteriological weapons is that even the most sincere assertions of peace-loving intentions do not free either side of suspicions that they are violating international agreements. The mutual mistrust possesses deep roots.

The USSR and the USA began working on bacteriological weapons in the 1930s. The history of their development in both countries is full of enough dramatic pages for a separate story. This work was conducted on a large scale, and as an example, the output capacity of a plant built during the war in Terra Haute, Indiana permitted production of up to a million bombs containing anthrax and 270,000 bombs containing botulinus toxin monthly. The possibility is not excluded that possession of bacteriological weapons by the Allies prevented their use by Hitler, who encouraged work in this direction.

Interest in bacteriological weapons weakened in both the USSR and the USA in the 1960s. The main attention was devoted to developing atomic weapons. Not just because of their higher effectiveness. Experts began to realize that bacteriological weapons are a danger primarily to noncombatants. Moreover viable spores and bacteria are highly resistant, and if the winds turn, the side that first used such weapons could be threatened by mass die-off. All of these ideas played a significant role in the drafting of the Convention on Biological Weapons, which was signed in 1972 by 108 states.

There is no doubt that the convention is a deeply humanitarian document. But there is also no doubt that it is full of contradictions, which not a single specialist can resolve today. The convention prohibits the development of strong-acting and persistent bacteriological substances, it limits the volume developed to just that necessary for research purposes, and it prohibits development of weapon delivery systems and propagation methods. The only kind of research that is permitted is that which is known to support creation of therapeutic and preventive drugs and other means of protection against bacteriological weapons, and in small quantities at that. However, in contrast to the nuclear arms agreements, this document contains no clear quantitative criteria

Henry Kissinger immediately turned attention to the convention's ambiguity, noting that in principle, it does not prevent research on offensive substances, inasmuch as such research would be required in order to accurately determine defensive measures. Under this cloak, it would have been easy to portray oneself as peaceable while developing all kinds of bacteriological preparations.

The bitter irony is that work on bacteriological weapons developed especially vigorously precisely after the convention was signed. The accomplishments of biotechnology were the scientific basis for this. In the mid-1970s a highly secret Scientific-Technical Council staffed by the country's leading scientists was established as part of the Main Administration of Microbiological Industry.

The production tasks were imposed upon the large Biopreparat Association, which had shops and plants all over the country. This association was referred to colloquially as "Ogarkov's system," after the name of the general who served as its first director. The system contained 18 scientific institutes employing 25,000 associates, five plants and a large storage facility in Siberia. Several institutes and plants formerly subordinated to purely peaceable departments such as the Ministry of Agriculture and the Ministry of Health also worked for "Ogarkov's system." "Ogarkov's system" did not involve itself in mass production of weapons, but a so-called "mobilization plan" existed. This plan specified the quantity and the sort of concoctions that were to be produced in response to a particular command.

In the "System's" Labyrinths

It is extremely difficult to collect material about "Ogarkov's system." There are still no legislative acts in Russia regulating public access to archives. Not just the latest information but even history long gone is buried in departmental circulars. A question regarding the financing of biological research is no less absurd than a request for permission to carry a suitcase filled with nuclear materials about.

Many specialists who deeply condemn development of offensive bacteriological weapons fear to speak openly on this subject. I made four different appointments for a meeting with one of the specialists, a colonel of medical service, but each time he failed to show up. Finally he gave an honest answer by telephone: He had already been waiting 20 years for an apartment from the "system," and in his old age he did not wish to be left with his principles but without housing. There is also another danger to those who violate the vow of silence. From the standpoint of laws currently in effect, nothing will change if the information that is made public provides evidence of violation of ratified international obligations. All of this compelled me to collect materials on the status of bacteriological weapons in our country under the conditions of total confidentiality.

As one of the officials of the Scientific-Technical Council tells it, literally all scientists were burning with the desire

to work in this forbidden area in the 1970s. There was but one reason, the most earthly—money. Given the traditionally meager financing provided to biological science in the USSR, only the military program provided a possibility for fully productive work.

The research assumed an especially high intensity after replacement of Academician Viktor Zhdanov, the first leader of the council and a man who fell into inertia, by the vigorous and extremely ambitious Yuriy Ovchinnikov. One of the country's youngest academicians, he had an excellent grasp of the party and political hierarchy. He enjoyed access into the highest offices, and he was the recipient of all imaginable state regalia. It was in those years that the truly royal palaces of the Institute of Bioorganic Chemistry, which were under Ovchinnikov's command and which were so eagerly shown to foreign guests as evidence of the party's concern for science, were built in those years in Moscow. Witnesses recall that when scientists tried to cautiously bring him down to earth, Ovchinnikov made no bones about calling them overfastidious to their face, and said that if he got the money, then that must mean that he was right. The academician died quite young, at 54, as if cursed by nature of his work, surrounded by people who immediately began soiling his name.

Every subdivision of Biopreparat was given its own building. The institute in Koltsov, near Novosibirsk, worked with deadly hemorrhagic fever and Venezuelan encephalitis viruses. Plague and anthrax strains needed for experiments were produced in Obolensk. Tularemia was studied and methods of raising the effectiveness of militarily valuable strains were developed in Leningrad.

Field tests were carried out on Vozrozhdeniye Island in the Aral Sea. Unexplained ecological disasters occurred regularly in these places right up until recent years. A massive fish die-off occurred in Aral in 1976. In May 1988 around half a million antelope perished on the Turgay Steppe. In July 1989 an outbreak of plague occurred in the steppes: Entire flocks of sheep lost their wool and died. Need I say that not a single commission seriously investigated these incidents?

Nonetheless, it is asserted today in the Russian Ministry of Defense that Vozrozhdeniye Island is suitable from an ecological standpoint for use as a preserve. It would be extremely interesting to check this out, but I don't know of a single Russian journalist who has been able to visit our bacteriological proving ground. However, it is difficult to reconcile the assertions of the Russian military with the fact that the Anglo-American proving ground on Gruinard Island off the coast of Scotland is considered to be uninhabitable for as much as 45 years.

By the mid-1980s the Pentagon realized that it had fallen behind the USSR, and it began devoting greater attention to this direction, increasing the financing from \$16 million in 1981 to \$91 million in 198- [one digit illegible]. It was only in recent years, after the disintegration

of the USSR, that funding of the Pentagon for bacteriological research was cut to 40 million.

The West's concern increased especially after the revelations made by Professor Vladimir Pasechnik, who remained in England in 1989. He was the director of the Institute of Especially Pure Biopreparations, which was part of "Ogarkov's system." By the way, this sharp turn in Pasechnik's life was itself interesting. The son of a Hero of the Soviet Union, he became director of the scientific institute at 38 years of age, and he enjoyed fabulous prospects for further growth. But after serving several years as director, the scientist realized the true goals of the program, and in his words, he decided to communicate them to the world public.

A Regime of Mutual Suspicions

It was from Pasechnik that the West obtained a significant amount of information on the Soviet bacteriological program. Following Pasechnik's flight, Doctor Yevgeniy Sventitskiy was appointed director of the institute in Leningrad. The American expert Mark Urban [transliteration] cited the words of an anonymous specialist about the new director: "This is a person who would infect Nevskiy Prospekt with plague if Moscow so ordered." This eloquence is confirmed by Pasechnik's information that it was Sventitskiy who was responsible in his time for carrying out explosions in special chambers with the goal of raising the combat effectiveness of bacteriological weapons. And today the West possesses information that the institute is continuing forbidden research aimed at creating persistent plague strains that are insusceptible to temperature changes or to the action of 16 known antibiotics.

Western leaders have made oral statements to Mikhail Gorbachev on several occasions regarding development of offensive biological programs in the USSR. Gorbachev invariably answered that he would "look into the problem," but he never did do anything. It was only in April 1992 that Russian President Boris Yeltsin admitted that the former USSR had violated the Convention on Biological Weapons, and he prohibited further development of these programs. After this, it became possible for a group of American and English experts to visit Pasechnik's institute, which had fallen under special suspicion, in December 1992.

However, in a press conference in St. Petersburg the Western experts did not even offer a hint of their impressions. At the same time Ye. Sventitskiy and some of our other representatives insisted that the institution had never been directly (?) involved in the military program. It was only in Washington, in the Center for International and Strategic Studies, that I was able to clarify that the overall opinion of the delegation was basically that in principle, the institute's equipment could be used for work in a forbidden direction; the silence was explained by the absence of obvious violations, and by the impression that the Russian specialists were being insincere.

By the way, complaints of violations of international agreements are a two-way street. I was able to acquaint myself in a certain Russian department with a document containing questions addressed to the American side pertaining to the study of new toxins, to the suspiciously extensive infrastructure, the special equipment and the elevated construction activity at Fort Dietrich, at the Daguz proving ground and in Pine Bluff. Russian experts believe that it is at the Daguz proving ground that "a developed and continually improving infrastructure makes it possible to conduct field tests on synthetically produced biological objects, including ones of a nature unknown to us."

It is not understandable of course why this document is classified, but it is for this reason that I will not risk communicating the name of the department. It may be that in order to have something to say in return, Russia picked these complaints out of the air. Didn't the USA categorically emphasize its faithfulness to the convention, after all? However, Barbara Rosenberg, director of a program for checking the chemical and biological programs of the American Federation of Scientists, and Doctor Meril Nass [transliteration] from Massachusetts University confirmed for me that they see no guarantees that the Pentagon is observing the biological weapons convention. For example, one of the questions pertains to a recent request for the financing of the construction of a new laboratory in Daguz, where large chambers surpassing the need of defensive programs are to be erected. There is information that the USA did not neglect development of prohibited systems for delivering bacteriological weapons in the 1980s. Specialists are also troubled by some specific types of preparations being studied in the USA that could be used to produce new types of persistent offensive substances.

I sought explanations for these things from American officials with great interest. However, Eliza Harris, a department director at the National Security Council, stunned me with something else: Washington knew nothing of what was happening on the Russian side. The impression was that in order to make life difficult for its successors, the previous administration destroyed many files containing information accumulated over 12 years, including on bacteriological weapons. The new associates were unable to get into the swing of things even in May.

I am forced to bitterly assert that the insincerity of politicians, concealment of needed information and bureaucratic maneuvers are compounding the already confused problems of bacteriological weapons. It is simply absurd to hope for public control in today's Russia. And even in America, things are only a little bit better. Gerald Epstein, a division director of the U.S. Congressional Committee for Technological Assessments, assured me that the press, which would never allow a sensational story to go unreported, was ensuring the USA's observance of international agreements in this

area. I would simply not wish to comment seriously on the dependability and effectiveness of such a mechanism.

Bacteria Are Capable Only of Offense

Bacteriological weapons are commonly referred to as the poor-man's atomic bomb, and they can be manufactured in third world countries. The possibility is not excluded that terrorists or simply madmen can use them. Data exist (I obtained this information from Russia's foreign intelligence service) indicating that Egypt, Israel, India, Iraq, Iran, Libya, Syria and Taiwan have conducted biological research of an applied military nature. Pakistan is especially active in this direction. Curiously enough, the Koran categorically prohibits the use of poisons and war gases, and is apparently the first document in human history that limits development of bacteriological weapons. But to our great regret, it is not the last that is violated light-heartedly while observing the strictest conspiracy.

The absence of mechanisms that would regulate development of bacteriological weapons is acutely felt today in all the world. Is it possible in principle for a path to exist by which Russia, the USA and other countries can reach agreement and trust in bacteriological research? It would be extremely rash for a journalist to offer such a recipe. Let the specialists solve the problem; still, however, two simple questions give me no rest.

Considering that infectious diseases spread so unpredictably and depend on so many factors, and that there are so many different kinds of viruses, isn't all of this talk about the defensive nature of bacteriological programs nothing more than a cunning maneuver having the purpose of misleading society? And in principle, don't all bacteriological programs serve the goals of aggression rather than defense?

And the second question: If all bacteriological weapon programs are open today and are exclusively peaceable, defensive in nature, which is precisely what specialists in both Russia and the USA assert, then why is such ambiguous research in the hands of the military? If the work was being carried out under the roof of civilian

departments, then public control would become much more effective, the room for mutual mistrust would diminish significantly, and therapeutic vaccines would finally find their way into the civilian population.

As a going-away present, Colonel Takafuji gave me a red mug bearing the emblem of his institute. I decided to give this mug to General Yevstigneyev. It would have been quite symbolic—the first peaceful exchange between Russian and American military bacteriologists. But on returning home, I discovered that the mug had broken en route. It seems that the devil is always at work behind these bacteriological weapons after all.

Fleas in the Eastern Kyzyl-Kum and Their Epizootic Significance

937C0247 St. Petersburg PARAZITOLOGIYA in Russian Vol 25 No 6, Nov-Dec 91 (manuscript received 15 Oct 88, after revision 13 Mar 91) pp 504-511

[Article by A. Ye. Rzhetskaya, L. P. Rapoport, L. M. Orlova, Kh. Kh. Nuriev, and L. P. Suslova; Chimkent Antiplague Station, USSR Ministry of Public Health, UDC 576.895.775(575.1)]

[Abstract] On the basis of a long-term (1972-1987) study, the species composition of fleas in various physical-geographic-epizootic regions of the Eastern Kyzyl-Kum and indexes of their prevalence on various hosts were established. A total of 24 flea species were found. One species dominated the rest—*Xenopsylla gerbilli caspica*, with *Cortopsylla lamellifer* becoming a mass population in the fall. Both are parasites of the large sand eel (*Rhombomys opimus*), a rodent. It was determined that the most significant and long-term changes in the mass populations of these two species occurred in connection with changes in the population density of the sand eels. It was statistically determined that the flea populations tracked two years after corresponding periods of oscillation in the host population. It was shown that the *X. gerbilli caspica* flea species plays a primary role in the transmission of plague pathogens; approximately 50% of all plague microbe strains isolated in the Eastern Kyzyl-Kum came from this species. Figures 1; references: 15 Russian.

Production of Recombinant Proteins and Their Use in Immunoblotting

937C0250A Moscow VOPROSY MEDITSINSKOY
KHIMII in Russian Vol 39 No 3, May-Jun 93
(manuscript received 29 May 91) pp 60-62

[Article by M.R. Farkhutdinov, F.G. Galiullin, E.G. Davletov, Sh.F. Gabbasov, and B.N. Safin, Bashkir Medical Institute, Ufa; UDC 616.98:578.828.6]-07:616.153.96-097-078.33]

[Abstract] A study examined the possibility of using precursors of HIV-1 surface and internal proteins obtained by genetic engineering methods in an immunochemical reaction to determine HIV antibodies. Variolovaccine virus was used to create the recombinant structures because it has no clear restrictions on the sizes of DNA molecule capable of forming an infectious particle and because it is the most studied representative of the poxvirus family. The WR strain of variolovaccine was used in a three-step process that entailed obtaining the recombinant plasmid, introducing it into the genome, and isolating the recombinant virus. The recombinant plasmid produced contained a hybrid gene flanked by DNA virus sequences. The structure included a variolovaccine promoter spliced in the corresponding orientation to the coding portion of the heterologous gene. The sequence was introduced into a viral gene insignificant to the development of the virus in a cell culture. 5-Bromodesoxyuridine was then used to select the recombinants. Homologous recombination occurred between the flanking sequences and viral gene, as a result of which the gene became a component of the viral DNA. The result was variolovaccine producer strains whose genomes code viral protein, i.e., precursors of p50 and gp120. The recombinant proteins were synthesized in a green marmoset kidney cell culture infected with strains of variolovaccine virus, separated in polyacrylamide gel, transferred to a nitrocellulose membrane, and incubated with blood serum. The antigen-antibody complex was revealed by using a conjugate of rabbit antibodies to peroxidase-labeled human immunoglobulins. A chromogenic substrate was added as a dye. Blood serum with

HIV antibodies and normal human serum served as the control. A panel of serum-positive, serum-negative, and false-positive sera was analyzed. Distinctly colored bands appeared on the study bands in the cases of positively reacting serum at the level of proteins with molecular masses of 50,000 and 120,000, thus confirming the presence of HIV antibodies in the given sera. Because the proposed antigen system is based on using green marmoset kidney cells to produce recombinant proteins, the possibility of false-positive reactions with cell proteins is eliminated, and the interaction of serum antibodies with the proteins of the variolovaccine itself is blocked by the rabbit antivariolovaccine serum. The recombinant genes can thus be used to detect antibodies to both internal and membrane virus proteins. The main benefits of the new test system based on the newly synthesized recombinant proteins are its specificity, high sensitivity, speed and ease of use, and economy. Figures 2; references 17: 4 Russian, 13 Western.

Oligosaccharide-Binding Molecules of the Surface of Neoplastic Hemopoietic and Lymphoid Human Cells

937C0241 Kiev EKSPERIMENTALNAYA
OKNOLOGIYA in English Vol 15 No 2, 1993 p 41

[Article by N.V. Bovin, E.Yu. Korchagina, T.V. Zemlyanushina, D.F. Gluzman, I.V. Abramenko]

[Abstract] Using immunocytochemical methods and carbohydrates attached to biotinylated polyacrylamide as the probes, the presence of oligosaccharide-binding molecules on the surface of normal and malignant hemopoietic and lymphoid cells were revealed. The specificity of the recognition was demonstrated by inhibition tests in the presence of the excess of low molecular weight ligands. An analysis of cell phenotype relation with the expression of carbohydrate-binding molecules was carried out. Preliminary data based on the study of carbohydrate structures expression show the differentiation of chronic B-lympholeukemia (low expression) from B-forms of non-Hodgkin's malignant lymphomas (high expression) and possibly ALL from AML also.

Splenic and Thymic Effects of Low-Intensity Helium-Neon Lasers

937C0236B St. Petersburg MORFOLOGIYA in Russian
Vol 102 No 4, Apr 92 (manuscript received 13 Jul 90)
pp 106-110

[Article by P.M. Larionov, G.G. Chasovskikh, G.V. Dorozhko, L.V. Bek and A.M. Volkov, Department of Clinical Pathomorphology and Experimental Pathology, Institute of Circulatory Pathology, RSFSR Ministry of Health, Novosibirsk; UDC 616.41+616.438]-091.8:615.849.19:599.323.4]

[Abstract] Impact of helium-neon laser (0.9 mWt/cm^2) irradiation of the thymus and spleen were assessed in 6 week old outbred rats. The histologic studies demonstrated that various combinations of irradiation (30 sec/day for 6-7 days of either organ; single 180 sec irradiation of both organs) in the thymic or splenic projections had stimulatory sequelae that persisted for 72 h. The findings indicated induction of myelo- and lymphopoiesis. The increase in the counts of germinal centers and differentiation and proliferation of plasma cells pointed to primary stimulation of humoral immunity. Tables 2; references 3 (Russian).

Electric Stimulation of Diaphragm in Asthmatics

937C0261A Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 65 No 3, Mar 93 (manuscript received 06 Apr 92) pp 23-25

[Article by Ye.S. Karashurova and Ye.S. Karashurov, Chair of General Surgery, Petrozavodsk State University; UDC 616.248-085:616.26-02:615.844]

[Abstract] Clinical trials were conducted on 36 male and female patients with bronchial asthma—average age 42.6 years—to assess the benefits of electric stimulation of the diaphragm. Transcutaneous stimulation was performed with ESD-2P apparatus via electrodes placed over the right and left sides of the diaphragm for 20 min/day for 7 days, employing 13-17—0.3 msec, 2 mA, 20-30 V—pulses/min. The results showed that pulmonary function indicators improved as a result of the electrotherapy, and included a statistically significant increase in the expiratory rate in patients with respiratory insufficiency. Change in central hemodynamics were unremarkable, although showing a slight increase in the cardiac index and reduction in peripheral vascular resistance. Figures 1; tables 2; references 16: 8 Russian, 8 Western.

EMF Decimeter Band Waves in Combined Management of Early Cerebrovascular Insufficiency

937C0276A Moscow VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KULTURY in Russian No 2, Mar-Apr 93 (manuscript received 11 Jun 91) pp 26-29

[Article by G.A. Leshchinskaya, 'Lermontov' Sanatorium, Odessa; UDC 616.831-005.4-036.4-085.844]

[Abstract] A cohort of 152 male and female patients 28-57 years old with early manifestations of cerebrovascular insufficiency were used in trials on the therapeutic efficacy of decimeter band EMF waves (120 mW/cm²). The EMF waves were directed on the right or left side of the thyroid gland on alternate days for 6 min/day for 14-17 days in combination with conventional hydrogen sulfide baths. The findings showed that inclusion of the EMF component had beneficial objective and subjective effects vs. the bath-only group. Vertigo, head noise and irritability decreased in a larger percentage of the experimental patients, accompanied by increased cerebrovascular elasticity and other positive rheoencephalographic findings. In addition, peripheral vascular resistance decreased by 18% in the experimental group vs. 10.6% in the control patients. Other effects included a statistically significant reduction in total serum cholesterol and atherogenic high density lipoproteins in the experimental patients, and a significant elevation in serum T₃ and T₄ levels. On an overall basis, marked clinical improvements were observed in 21.1% of the patients on EMF + bath therapy, which persisted for more than a year in 56.5% of the cases, versus corresponding figures of 9.7 and 17.6% in the control subjects. References: 8 (Russian).

Neural Effects of Vasoactive Agent Dimephosphone

937C0287A Kazan KAZANSKIY MEDITSINSKIY ZHURNAL in Russian Vol 74, No 1, Jan-Feb 93 (manuscript received 19 May 92) pp 8-12

[Article by R.Kh. Khafizyanova, I.A. Studentsova, V.I. Danilov, I.S. Mokrinskaya, R.A. Garayev, A.B. Gorozhanin, A.O. Vizel and A.A. Muslinkin, Chairs of Pharmacology and of Neuropathology, Neurosurgery and Medical Genetics, Kazan Order of the Red Banner of Labor Medical Institute imeni S.V. Kurashov; Institute of Organic Physical Chemistry imeni A.Ye. Arbuzov, Kazan Scientific Center, Russian Academy of Sciences; UDC 615.21]

[Abstract] A review is presented of the pharmacodynamics of dimephosphone [sic], with emphasis on its application to cerebrovascular medicine. In particular, in experimental and clinical trials involving 1227 patients dimephosphone has been shown to normalize cerebrovascular circulation and blood supply in cases of brain tumor and trauma. Accordingly, the Pharmacological Committee has approved dimephosphone for clinical use on 20 Dec 90. Depending on indications, treatment with dimephosphone may last from 3 days to 2 months. Recommended intravenous dosages are 10-30 mg/kg 1-4X/day for 7-10 days. References 3 (Russian).

Production Technology and Strength of Porous, Permeable Titanium and Titanium Nickelide Materials for Dental Implant

937C0287B Kazan KAZANSKIY MEDITSINSKIY ZHURNAL in Russian Vol 74, No 1, Jan-Feb 93 (manuscript received 04 Feb 92) pp 70-72

[Article by M.Z. Mirgazitov, M.A. Chobonyan, V.I. Itin, and V.E. Gyunter, Chair of Orthopedic Stomatology, Kazan Order of the Red Banner of Labor Medical Institute; Russian Medical Engineering Center for Shape-Memory Implants, Tomsk; UDC 616.314-089.28/.29-089.843:546.821/.824]

[Abstract] Technical details and sintering tables are presented on the preparation of porous titanium (T) and titanium nickelide (TN) shape-memory materials for dental implants. In general, the mechanical properties of TN exceeded those of T and appeared to be better suited to the type of stresses encountered in stomatologic practice. These impressions were confirmed in long-term ongoing clinical trials now approaching 9 years. Tables 3; references 7 (Russian).

Device for Prevention of Wound Infections

937C0287C Kazan KAZANSKIY MEDITSINSKIY ZHURNAL in Russian Vol 74, No 1, Jan-Feb 93 (manuscript received 07 May 92) pp 72

[Article by O.S. Kochnev (dec) and S.G. Izmailov, Chair of General and Emergency Surgery, Kazan Institute of Advanced Training of Physicians imeni V.I. Lenin; UDC 617.55-001.4-002-039.71]

[Abstract] A suction device has been constructed for use in cleaning the peritoneal cavity in abdominal surgery, the basic design consisting of two coaxial tubes. The outer tube is designed to provide irrigation—NaCl or furacillin solution—while the inner tube suctions tissue detritus. Trials on 38 patients demonstrated this appliance to be effective in precluding infectious complications. Figures 1.

Effect of Synthetic Delta Sleep-Inducing Peptide Analogs on Factors of Antimetastatic Resistance in Mice With Lewis Carcinoma

937C0240B Kiev *EKSPERIMENTALNAYA ONKOLOGIYA* in Russian Vol 15 No 1, Jan-Feb 93 (manuscript received 09 Apr 92) pp 76-78

[Article by Yu. P. Shmalko, I. M. Smirnov, I. I. Mikhaileva, A. P. Chalyy, V. Yu. Umanskiy and S. N. Grinzhetskaya; Institute of Experimental Pathology, Oncology, and Radiobiology imeni R. Ye. Kavetskiy, Ukrainian Academy of Sciences, Kiev; UDC 616-006-092.9:615.277.3]

[Abstract] The effect of DSIP analogs on some mechanisms of metastasis and factors of antimetastatic resistance was studied on 240 male C57B1/6 mice, 23-25 g, infected with carcinoma 3LL by means of an injection into the thigh. The results showed that as the carcinoma 3LL grew, adenosine deaminase activity in murine peritoneal macrophages decreased, while 5'-nucleotidase activity increased in the experimental mice in comparison with these indexes in control mice. The administration of DSIP analogs reversed these two trends, creating the conditions for a decrease in the intracellular concentration of adenosine. In addition, it was shown that the DSIP analogs can restore the functional activity of macrophages in mice with Lewis carcinoma by stimulating the suppressed functional activity of peritoneal and alveolar macrophages and normalizing the high activity of splenic macrophages. It was also shown that 24 h pretreatment of a monolayer of NIH-3T3 cells with DSIP analogs evidently prompts a decrease in the adhesiveness of the cellular monolayer. Tables 5; references 7: 4 Russian, 3 Western.

"Vaulen" Enterosorbent Sorption of *Enterobacteriaceae* Family Bacteria

937C0245A Minsk *VESTNIK BELORUSSKOGO GOSUDARSTVENNOGO UNIVERSITETA. SERIYA 2. KHIMIYA BIOLOGIYA GEOGRAFIYA* in Russian No 2, 1992 (manuscript received 29 Jun 92) pp 34-36

[Article by S. P. Chernov, Yu. M. Grinevich, V. A. Kat'ko; UDC 578.81]

[Abstract] The sorption activity of Vaulen, an enterosorbent developed at the Institute of General and Inorganic Chemistry, Belorussian Academy of Sciences, was studied with respect to the enterobacteria *E. coli*, *K. pneumoniae*, and *E. herbicola*. Vaulen is a fibrous charcoal sorbent that is very porous (up to 1.2 cm³/g) with a high specific surface area (up to 2,000 m²/g) that has been approved for use in powder

form as an enterosorbent. The bacterial cells were cultured for 18-20 h. Study of the kinetics of the sorption process revealed differences in the intensity and sorption levels for the different bacteria. Within 30 minutes 99.84-99.98 percent of the bacteria were absorbed. Differences in the rates and levels of absorption were attributed to differences in the morphology of the microorganisms. In conclusion, Vaulen is very effective against *Enterobacteriaceae* family bacteria. Figures 1; tables 1; references 3 (Western).

Microsurgical Transplantation of Vascularized Bone From Human Fetus to Human

937C0238A Moscow *KHIRURGIYA* in Russian No 1, Jan 93 (manuscript received 25 Mar 92) pp 51-56

[Article by N. O. Milanov, S. N. Chaushev, Ye. I. Trofimov, and Ye. B. Svirshchevskiy; Plastic and Reconstructive Microsurgery Department, Surgery Research Center, Moscow]

[Abstract] This paper presents the results of three cases in which human fetal bone tissue was transplanted into humans with defects in their hands due to accident or disease. The operations involved fetal tissue obtained at 23-26 weeks of gestation as the result of spontaneous abortion. One operation team prepared the patient's bone for the transplant while the other worked with fetal bone tissue. The patients were not given any immunosuppressants. Ultrasound dopplerography radioisotope scintigraphy, x-rays, and histologic examination were employed to monitor transplant viability. Observation for up to 6 months revealed no signs of rejection. Figures 7; references 4: 3 Russian, 1 Western.

Therapeutic Efficacy of Liposomal Form of Cytarabine in Mice With Leukemia

937C0240A Kiev *EKSPERIMENTALNAYA ONKOLOGIYA* in Russian Vol 15 No 1, Jan-Feb 93 (manuscript received 24 Mar 92) pp 69-72

[Article by N. M. Fertukova, V. P. Reshchikov, O. P. Pleteneva, and N. I. Afonin; All-Union Hematology Research Center, Russian Academy of Medical Sciences, Moscow; Clinical and Experimental Immunology Scientific Research Institute, Russian Federation Ministry of Health, Moscow; UDC 616.155.392]

[Abstract] The therapeutic efficacy of liposomal cytarabine as compared to free cytarabine in treating leukemia was investigated in C57BL and BDF (DBA2xC57BL) mice, 18-22 g, infected with leukemia strains L-1210, P-388, and La. Liposomal cytarabine and free cytarabine were administered intraperitoneally in doses of 5.5-100 mg/kg in volumes of 0.2-0.3 ml/mouse one, two, three or five times after the leukemia inoculation. Comparison of liposomal cytarabine and free cytarabine in doses of 75 mg/kg revealed that the liposomal cytarabine was more effective, increasing the average life span 184-222 percent, while free cytarabine increased the life span only 53-56.8 percent. By the time the control mice had died

from the leukemia, the experimental mice displayed normal cellular composition of the peripheral blood. The erythrocyte and leukocyte counts in the blood of most experimental mice were normal by day 25 following the leukemia inoculation. In conclusion, liposomal cytarabine in a course dose of 75 mg/kg was of greatest therapeutic efficacy, increasing the average life span by 216.4-234.5 percent. However, higher doses of liposomal cytarabine were toxic to the animals and actually reduced the life span. Figures 2; tables 1; references 5: 2 Russian, 3 Western.

Radioprotective Action of PAX-Trypsin

937C0283C Moscow *PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA* in Russian No 1, Jan-Feb 93 (manuscript received 13 Jun 91) pp 15-17

[Article by A.I. Volozhin, V.I. Pronin and A.V. Lopatin, Moscow Medical Stomatological Institute imen N.A. Semashko; UDC 615.355:577.152.344].017:615.849.1.015.25].076.9]

[Abstract] Trials on the radioprotective potential of PAX-trypsin (trypsin immobilized on a synthetic matrix; PT) were performed on 160-180 g outbred white rats subjected to 60 Gy gamma irradiation in 5 Gy fractions at 24 h intervals. Following each irradiation the sites were treated twice for 35-40 min with applications of PT-impregnated dressings. Histologic studies demonstrated that the primary action of PT consisted of stabilization of endotheliocyte membranes. The latter phenomenon significantly reduced the level of edema, maintained skin pO₂ at adequate levels, and thereby accelerated tissue regeneration. Figures 2; references 5: 4 Russian, 1 Western.

Adrenergic Mechanisms in Recovery of Oxygen Balance in Shock

937C0283B Moscow *PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA* in Russian No 1, Jan-Feb 93 pp 28-30

[Article by A.I. Tyukavin and I.V. Kretser, Laboratory of Experimental Pathology, St. Petersburg Scientific Research Institute of Emergency Medicine imeni I.I. Dzhanelidze; UDC 616-001.36-092.9-07:616.152:11+616.153.21]

[Abstract] An assesment was made of the adrenergic mechanisms supporting oxygen balance in cats with post-traumatic shock, using 0.02 mg/kg klonifen [sic] injections. The experimental model involved either thoracotomy or laparotomy, followed either by removal of 20% of the blood volume or pneumothorax induction in the male and female cats. Assessment of cardiac function and hemodynamic

monitoring resulted in data indicating that the net effect of klonifen consisted of restoration of a temporary balance between oxygen demand and supply in the case of the vital organs, e.g., the brain. Acting on adrenergic α_2 receptors, klonifen modified both oxygen demand in the face of oxygen starvation and reallocation of the cardiac output to critical organs and tissues. On that basis, klonifen may have clinical potential in alleviating catabolic damage in traumatic shock. Figures 1; references 7: 5 Russian, 2 Western.

Sodium and Lithium GABA Salts in Experimental Burn Shock

937C0283A Moscow *PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTALNAYA TERAPIYA* in Russian No 1, Jan-Feb 93 (manuscript received 11 Jun 91) pp 26-28

[Article by N.I. Kochetygov, M.I. Remizova and A.B. Makeyev, Laboratory of Experimental Pathology, St. Petersburg Scientific Research Institute of Hematology and Blood Transfusion; UDC 616-001.17-001.36-085.31:547.473.2]-092.9]

[Abstract] Comparative efficacy trials were conducted with the sodium and lithium salts of GABA in the management of shock in 2.9-2.8 kg chinchilla rabbits induced by 3rd degree burns covering 20% of the body surface. Conventional therapy with isotonic NaCl (15 ml/kg; i.v.) was supplemented with either the sodium or lithium salt (100 mg/kg). The survival rates for control rabbits managed solely with NaCl, NaCl+GABA Na salt and NaCl+GABA Li salt were, respectively, 20, 30 and 80%. The greater therapeutic benefit of the Li salt was attributed to its superior cardiotonic action leading to improved hemodynamics and, hence, more efficient correction of acid-base imbalance. Tables 3; references 13 (Russian).

Cytodifferentiation of Neural Elements of the Spinal Cord and Neocortex of Rats When Implanted in the Peripheral Nerve

937C0254A St. Petersburg *TSITOLOGIYA* in Russian Vol 35, No 1 93 [Signed to press 19 Jan 93] pp 59-64

[Article by E. S. Petrova, E. I. Chumasov]

[Abstract] Embryonic tissue from the neocortex and spinal cord of 14-day-old rat embryos was used as the material to be implanted. Electron microscopy was used to examine the ultrastructure of the implants at various times after being transplanted in the damaged sciatic nerve of mature rats. It was shown that within 7 days the undifferentiated neural elements which were transplanted in the nerve acclimatized well, and developed to fully mature neurons, which remained viable for 8 months of observation. The high degree of differentiation in the neurons can be seen by the fact that a chromatophilic substance formed in their cytoplasm.

Moreover, a dense neuropile formed, and processes of synaptogenesis and myelination of the axones occurred. Immature synaptic contacts were encountered within 7 days at the neuroblastic stage in the implants of the neocortex and spinal cord. Within 14 days, a large number of morphologically mature axodendritic synapses formed in the spinal cord, as opposed to the neocortex. Axonal myelination in the implants of the spinal cord began within 21 days after transplantation, while it began within 30 days in the implants of the neocortex. It has been established that synaptogenesis in both types of implants precedes the formation of myelinic fibers. It was noted that the implants of the spinal cord develop more rapidly than the implants of the neocortex. However, the processes of synaptogenesis and myelination in both types of implants are delayed by 1-2 weeks as opposed to these processes in situ in the central nervous system. 27 references.

Change in Content of Lipids and Biologically Active Substances due to Ultraviolet Irradiation of the Blood in an Experiment With Peritonitis

937C0274A Kiev *KLINICHNA KHIRURGIYA*
in Russian No 4, 1993 [Signed to press 1 Jul 93]
pp 43-45

[Article by A. R. Gutnikova, S. S. Abidova; UDC
616.381-002+615.831.4]

[Abstract]The focus of the research was to determine how ultraviolet irradiation of the blood affects the content of lipids in the blood, as well as the content of a number of biologically active substances. In dogs with experimental peritonitis, lipid metabolism was impaired when toxic metabolic products accumulated. When endotoxemia became less pronounced due to ultraviolet irradiation, the blood level of biologically active substances decreased, and the process of lipolysis was suppressed.

Response of Atrial Granules to Decimeter Band Electromagnetic Fields Directed at Cardiac and Thyroid Regions

937C0236A St. Petersburg MORFOLOGIYA in Russian Vol 102 No 4, Apr 92 (manuscript received 12 Feb 91) pp 68-74

[Article by M.S. Geniatulina and Yu.N. Korolev, Laboratory of Morphology, All-Union Scientific Center for Rehabilitation and Physical Therapy, Moscow; UDC 611.127:612.43:612.014.42.067:599.325]

[Abstract] The demonstration that decimeter band electromagnetic fields (EMFs) activate adrenergic systems lead to an assessment of impact of this band on atrial granules. The experimental model utilized 2600-3200 kg chinchilla rabbits exposed to 120 mW/cm² EMFs targeted at the heart or thyroid areas (6 min/day; 6 or 10 days). Ultrastructural assessment in both sets of experiments showed that EMF exposure resulted in localized quantitative changes, consisting of accelerated maturation of the vesicles, release of granules into the cytoplasm and their transformation into natriuretic peptides. The changes were more pronounced when the thyroid area was irradiated, indicating thyroid involvement in the myocardial endocrine response. Figures 2; Tables 1; references 6: 2 Russian, 4 Western.

Mechanism of Action of Microwave Resonance Therapy in Infantile Cerebral Paralysis

937C0276B Moscow VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KULTURY in Russian No 2, Mar-Apr 93 (manuscript received 02 Dec 92) pp 39-43

[Article by K.A. Semenova, V.D. Zhukovskiy, B.Ye. Petrenko, V.I. Dotsenko, I.G. Sheynkman and A.L.

Kurenkov, Russian Scientific Methodological Center for Rehabilitation of Infantile Cerebral Paralysis, Moscow; 'Otklik' Interindustry Scientific Engineering Center for Biophysics and Microwave Resonance Therapy, Kiev; UDC 616.831-009.11-053.2-085.849.112]

[Abstract] Trials with microwave resonance therapy (MRT) were conducted on 26 8-12 year old patients with infantile cerebral paralysis manifesting as spastic diplegia. Treatment with MRT lasted for up to 5 min per session with synergy bands localized to the 56.5 to 61 GHz frequencies on a case-by-case basis (reproducible with an accuracy of +/- 0.1 GHz). MRT was directed at 28 acupuncture points of which the following were most responsive in inducing synergies of the leg and pelvis muscles: F1, F2, F3, F5, E36, G14, R1, R3, R4 and R5. EMG monitoring demonstrated a 30% increase in the amplitude and a 12% increase in frequency in response to MRT. Concomitant EEG studies showed cortical activation and inhibition of subcortical formations in conjunction with partial normalization of vestibular nystagmus. The therapeutic benefits consisted of an increase in the force and extent of elementary movements. The comprehensive data were interpreted to suggest that MRT acts in a reflex manner—thereby correcting impaired afferent pathways—with rapid generalization to distal synergistic muscle systems and the vestibular apparatus. Accordingly, MRT appears activate the central structures of the motor analyzer, leading to some recovery of control over spinal motoneurons. Tables 1; references 8: 6 Russian, 2 Western.

Individual Myelopeptide Has a Corrective Effect on Antibody Production in Cases of Adriamycin-Induced Immunodeficiency

937C0252A Moscow IMMUNOLOGIYA in Russian No 2, Mar-Apr 93 (manuscript received 15 May 92) pp 17-19

[Article by S. Yu. Shanurin, S. A. Guryanov, and A. A. Mikhaylova; Institute of Bioorganic Chemistry imeni M. M. Shemyakin, Russian Academy of Sciences, Moscow; UDC 615.362.419.018]

[Abstract] The goal of this work was to study the immune-correcting properties of myelopids (MP), a group of domestically developed myelopeptides, in cases of secondary immunodeficiency induced by adriamycin. An individual MP, isolated from porcine bone marrow cell culture supernatant, had a correcting effect on antibody production in mice with adriamycin-induced immunodeficiency during the peak primary response to sheep erythrocytes (SE). The MP immune-correcting effect had a dose dependent character that was observed *in vitro* in culture and *in vivo* in the system. It was proposed that the MP induced the synthesis and secretion of antibodies in reserve "dormant" antibody-forming cells (AFC) that are apparently located in a slowly regenerating population of lymphocytes that are least affected by adriamycin. The isolated MP was one of the components of a myelopid preparation and contributed to the immune-correcting activity of this immunomodulator. Figures 2; references 10: 9 Russian, 1 Western.

Evaluation of the Immune Status of Various Groups of Chemical Industry Workers, Using the Matrix Method of Mathematical Analysis

937C0252C Moscow IMMUNOLOGIYA in Russian No 2, Mar-Apr 93 (manuscript received 12 Mar 92) pp 54-56

[Article by A. V. Kulakov, B. V. Pinegin, A. I. Martynov, and R. M. Khaitov; Institute of Immunology, Russian Ministry of Public Health, Moscow; UDC 616-057-092:612.017.1]-02:613.632]-07-519.24]

[Abstract] The goal of this work was to apply analyses based on the matrix method to evaluation of the immune status of various groups of chemical industry workers in an ecologically poor region of the Urals. The workers' immune status was divided into three types: normal, intermediate, and altered. Matrix analyses of healthy workers and workers with various immune disorders indicated that the healthy workers had a normal immune status, workers with infectious syndromes had pronounced alterations, and workers with allergic and infectious-allergic syndromes had an intermediate status. The

intermediate type of immune status was observed both in plant managers who did not have direct contact with industrial activities and in workers who were in contact with dust, methanol, formaldehyde, diazodinitrophenol, cresol, and phenol, where the most altered indicators were characterized by activation of the immune system. References 12: 11 Russian, 1 Western.

Link Between Radioprotective Activity and Other Biological Effects of Some Carbocyclic Analogues of PGH₁

937C0273A Minsk VESTSI AKADEMII NAVUK BELARUSI, SERYYA BIYALAGICHNYKH NAVUK in Russian No 1, 93 (signed to press 1 Mar 93) p 126

[Synopsis of article by M. B. Golubeva, N. A. Konoplya, V. M. Nasek, A. Ye. Mashkovich, G. A. Shafranskaya, and B. B. Kuzmitskiy, VESTSI AKADEMII NAVUK BELARUSI, SERYYA BIYALAGICHNYKH NAVUK, No 1, 1993, pp 87-90; UDC 615.37:577.346]

[Text] A study was made of eight stable analogues of PGH₁ endoperoxide on cellular and humoral immune reactions, tumor growth, radioresistance of mice, and lability of rat erythrocyte membranes. It was established that most compounds can affect the immune response of cells; some analogues stimulate humoral immunity and show a tendency toward antineoplastic and radioprotective activity. Analysis of the findings indicates that there is no future in selecting radioprotective agents among compounds with this structure on the basis of signs of marked immunomodulating activity or change in lability of cell membranes. 1 table, 9 references.

©Vydavetstva "Navuka i tekhnika". Vestsi AN Belarusi, seryya biyalagichnykh navuk, 1993

Use of Glucosaminyl Muramyl Dipeptide for Prevention and Treatment of Postoperative Infectious Complications and Pyoseptic Processes in Surgery Patients

937C0252B Moscow IMMUNOLOGIYA in Russian No 2, Mar-Apr 93 (manuscript received 6 May 92) pp 47-53

[Article by T. L. Shcheltsyina, A. A. Butakov, I. A. Antipov, S. M. Darchiyev, A. B. Klypin, B. V. Pinegin, Ye. A. Yeshidorzhiyeva, and T. M. Andronova; Institute of Immunology, Russian Ministry of Public Health, Moscow; UDC 617-089.168-06:616.94]-092:612.017.1]-084]

[Abstract] Administration of glycopin, a glucosaminyl muramyl dipeptide preparation from the Institute of Bioorganic Chemistry imeni M. M. Shemyakin, to patients with colon and rectal cancer prior to the post-operative period provided for a reduction in the number

of postoperative pyoseptic and infectious complications from 50 to 12.5%, and in fatalities from 10 to 3.12%. Glycopin therapy in this group led to significant stimulation of leucocyte production and the functional activity of neutrophilic granulocytes in the peripheral blood as well as increases in the amounts of CD4⁺ and CD16⁺, the CD4⁺/CD8⁺ ratio, and the cytotoxicity of CD16⁺-cells with respect to the K 562 blast cell line. Inclusion of glycopin in the complex therapy of surgery patients with pyoseptic processes provided for a reduction in the number of complications from 61 to 17.3%, and in fatalities from 27.7 to 6.9%. Use of glycopin in this group resulted in a significant increase in the number of leucocytes and particularly neutrophilic granulocytes, increased their functional activity as compared to the control group, prevented the development of anemia and hypogammaglobulinemia, and was accompanied by increases in the number of CD5⁺- and CD4⁺-lymphocytes and the CD4⁺/CD8⁺ ratio, as well as a proliferative response in spontaneous and phytohemagglutinin-induced lymphocyte blast transformation reactions in the peripheral blood. References 31: 3 Russian, 28 Western.

Pattern of Accumulation of Radionuclides in Bream From the Pripyat River

937C0273B Minsk VESTSI AKADEMII NAVUK
BELARUSI, SERYYA BIALAGICHNYKH NAVUK
in Russian No 1, 93 (signed to press 1 Mar 93) p 127

[Synopsis of article by V. V. Yermolayev, VESTSI AKADEMII NAVUK BELARUSI, SERYYA BIALAGICHNYKH NAVUK, No 1, 1993, pp 105-108; UDC 597.554.3+[502.55:621.039.7]

[Text] It was shown that the highest levels of radioactive isotopes were found in bream in the first 2 years after the accident at the Chernobyl Nuclear Power Plant, with respect to γ -active ones in 1986 and β -active ones in 1987. In the next 2 years there was a decline in radionuclide levels of soft organs and tissues, but further elevation in bones. In addition, there was more uniform distribution of radioactive isotopes in the bream population of the segment of the Pripyat River that was exposed to radioactive contamination. 2 illustrations; 9 references.

©Vydavetstva "Navuka i tekhnika". Vestsi AN Belarusi, seryya biyalagichnykh navuk, 1993

Involvement of Neuropeptide Y (NPY) and Catecholaminergic Brain Systems in Feeding Behavior

937C0264A Moscow *ZHURNAL VYSSHEY NERVNOY DEYATELNOSTI IMENI I.P. PAVLOVA* in Russian Vol 43, No 1, Jan-Feb 93 (manuscript received 30 Aug 91; in final form 18 Sep 91) pp 61-68

[Article by Ye.V. Borisova and T. Kadar, Institute of Normal Physiology imeni P.K. Anokhin, Russian Academy of Medical Sciences, Moscow; Institute of Pathophysiology, Medical University, Szeged, Hungary; UDC 612.821.6+612.391+615.78+612.8.015]

[Abstract] Studies on 160-220 g Wistar rats demonstrated that administration of 100 ng of NPY into the lateral ventricles of the brain inhibited food intake for 4 h, while 5 µg resulted in significant ($p < 0.01$) enhancement of ingestion. Drinking patterns were not affected. Intraventricular administration of prazosin (4 µg/rat), an α_1 adrenergic blocker, abrogated the effects of 5 µg of NPY, but catecholaminergic antagonists (yohimbine, propranolol) acting on different classes of receptors were without effect. There was no interference with the 100 ng NPY dose. Naloxone also counteracted the effects of 5 µg of NPY, but—again—not of 100 ng of NPY. Accordingly, the data indicate that NPY—depending on concentration—acts via different receptors, that its mechanisms of action are intimately related to the

catecholamine system, and that NPY affects feeding behavior via α_1 adrenoreceptors. Figures 3; references 22: 1 Russian, 21 Western.

Protective Effect of the FMRFa Endogenous Antagonist of Opioid Receptors During Hypoxic Shock in Rats

937C0255 Moscow *VESTNIK MOSKOVSKOGO UNIVERSITETA: BIOLOGIYA* in Russian No 4, Oct-Dec 92 (manuscript received 15 Jun 92) pp 35-38

[Article by I. Yu. Belov, T. V. Mamayeva, N. A. Sokolova, V. B. Koshelev, V. N. Krylov, I. B. Parin, and Ye. N. Novoselova; UDC 576.31:612.172.6]

[Abstract] In experiments on rats subjected to acute hypobaric hypoxia, the FMRFa endogenous antagonist of opioid receptors (0.5 and 1 mg/kg, intraperitoneally) exhibited a pronounced protective effect that manifested itself as increases in the time at which "posture loss" occurred, lifetime, and physical endurance. The effectiveness of FMRFa was definitely greater than that of naloxone, a non-peptide antagonist of opioid receptors, with respect to acting on the onset of posture loss. It was proposed that one of the possible mechanisms of FMRFa's protective effect was increased activity of the sympathetic nervous system, mediated by inhibition of the endogenous opioid system. References 8: 5 Russian, 3 Western.

Problems Associated With Introducing Mandatory Medical Insurance in Russia

937C0263A Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 65, No 1 93 [Signed to press 16 Dec 92] pp 4-6

[Article by V. I. Starodubov; UDC 614.2:368(470)]

[Abstract] A brief introduction to the various types of medical insurance is given. Ways medical insurance can be paid for are explored, including the Western approach. Key elements of the Russian medical insurance law are set forth, along with timelines for its implementation. Two key issues involving the fate of the Russian medical insurance law and its future role are examined. Provisions to implement the law in Russia are discussed, and the standard legal acts which form the basis for introducing a medical insurance system in Russia are enumerated. The importance of federal medical standards for Russia is explained.

Infectious Diseases in the Russian Federation

937C0271A Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 64, 1992 No 11 [Signed to press 9 Nov 92] pp 3-7

[Article by V. I. Pokrovskiy; UDC 616.9:313.13(470)]

[Text] The opinion that infectious diseases no longer play a significant role in human pathology should be considered to be mistaken. Of course, there have been no epidemics of smallpox, cholera, typhoid fever and typhus in economically developed countries in recent years. In comparison with the period before immunizations were started (1957), the incidence of diphtheria and poliomyelitis decreased by 160 times, that of whooping cough decreased by 50 times, and that of measles decreased by 16. But even today infectious diseases remain a pressing problem to Russian and world public health in terms of their medical and socioeconomic significance. In each of the last 5 years an average of 46.0 million cases of just infectious diseases on which mandatory records are kept using Form 85—Infection (Table 1), which cause a total economic loss of over 7 billion rubles annually (1986-1989 prices), have been recorded in Russia. The number of cases of infectious diseases recorded in these same years in the former USSR fluctuated at around 80.0 million. If we consider that diseases are recorded when patients apply for medical assistance and when sick leave passes are issued, it is obvious that the actual disease incidence exceeds that recorded by a minimum of three times. This premise is confirmed by selective studies conducted in different regions of the USSR. This understatement is the product of both objective and subjective causes. Some patients did not apply for medical assistance because of a relatively mild course of disease, while others received a nosological diagnosis without a clear reference to etiology (pneumonia, angina etc.), rather than a diagnosis of infectious disease. This pertains primarily to viral infections, since the laboratory base of public health is

almost completely lacking in modern analysis methods, and incapable of carrying out qualified virological analyses in the necessary volume. A similar picture also evolved in relation to a number of bacterial infections. Moreover violations of the rule of mandatory recording of cases of infectious diseases perpetually occur.

One of the most important characteristics of an epidemiological situation is disease dynamics. A certain decrease in the overall indicator of infectious morbidity in the Russian Federation with an average annual rate of -3.2 percent has been recorded over the last few years.

The infectious diseases considered here can be divided into four groups depending on this rate:

- 1) those characterized by significant growth of morbidity (a rate from +10 to +20 percent)—salmonellosis, yersiniosis, leptospirosis, whooping cough, tick-borne encephalitis;
- 2) those characterized by slight growth of morbidity (a rate from +3 to +9 percent)—influenza, viral hepatitis A, diphtheria, rickettsiosis, anthrax, tetanus;
- 3) those characterized by slight decline in morbidity (a rate from -2 to -9 percent)—acute intestinal infections of unestablished etiology, meningococcal infection, chicken pox, hemorrhagic fever, acute respiratory diseases;
- 4) those characterized by significant decline in morbidity (a rate from -10 to -50 percent)—typhus, dysentery, brucellosis, scarlet fever, measles, German measles, epidemic parotitis.

Each year in 1986-1991 an average of 19,400 persons, or 13.4 per 100,000 population, died of infectious diseases in the Russian Federation.

As before, influenza and acute respiratory diseases occupied the dominant position in the structure of infectious pathology—93 percent. Moreover according to official statistics the incidence of acute respiratory diseases is declining while that of influenza is rising.

The incidence of influenza and acute respiratory diseases is higher in the urban population. The highest morbidity indicators in Russia are continually recorded in large industrial cities, as well as in cities located in the Far North, especially among children (regardless of the etiology of epidemics) up to 6 years old, which most researchers associate with worsening of the ecological situation. Influenza and acute respiratory diseases are among the principal risk factors for young children, patients with cardiovascular and pulmonary pathology, patients with tumors, and the elderly.

Thus according to the Scientific Research Institute of Influenza additional incidence of cardiovascular and pulmonary diseases rises by 203 percent while additional deaths increase by correspondingly 16.5 and 5.9 per 1 million inhabitants during influenza epidemics.

Table 1. Average Infectious Morbidity in Russia in 1986-1990. Morbidity of Inhabitants of Cities and Rural Settlements. Age Distribution of Patients. Structure. Economic Significance

Key: 1. Typhoid fever 2. Paratyphoid 3. Other salmonella infections 4. Dysentery 5. Acute intestinal infections of established etiology 6. Acute intestinal infections of unestablished etiology 7. Viral hepatitis A 8. Viral hepatitis B 9. Yersiniosis 10. Brucellosis 11. Acute poliomyelitis 12. Leptospirosis 13. Total for intestinal infection group 14. Diphtheria 15. Whooping cough 16. Scarlet fever 17. Measles 18. German measles 19. Meningococcal infection 20. Epidemic parotitis 21. Chicken pox 22. Total for respiratory infection group 23. Tularemia 24. Tick-borne encephalitis 25. Hemorrhagic fever 26. Epidemic typhus 27. Malaria 28. Other rickettsiosis 29. Total for blood infection group 30. Anthrax 31. Tetanus 32. Rabies 33. Total for integumentary infection group 34. Total not including influenza and acute viral respiratory infections 35. Influenza 36. Acute viral respiratory infections 37. Total including influenza, acute viral respiratory infections 38. Nosological Form 39. Number of Patients 40. Total 41. Absolute 42. Per 100,000 43. Including in 44. Cities 45. Rural Settlements 46. Age Structure, % 47. 0-14 Years 48. 15 Years or More 49. 1986-1990 Yearly Dynamics, %

№	(38) Нозологическая форма	(39) Число заболеваний										(46) Возрастная структура, %				(49) 1986-1990 Темп изменения, %
		(40) всего		(43) в том числе:		(45) по месту жительства		(47) 0-14 лет		(48) 15 лет и более						
		(41) абс.	(42) на 100 тыс.	(44) абс.	(43) на 100 тыс.	%	(45) абс.	(45) на 100 тыс.	%	(47) абс.	%	(48) абс.	%			
1	Ветряная оспа	1 148	19	760	13	65	1	20	1	64	0.01	65	0.01	10.0		
2	Паратиф	280	5	170	3	11	0	15	0	15	0.02	15	0.02	10.0		
3	Другие сальмонеллезные инфекции	140	2	80	1	5	0	7	0	7	0.01	7	0.01	10.0		
4	Дисентерия	140	2	80	1	5	0	7	0	7	0.01	7	0.01	10.0		
5	Острые кишечные инфекции неустановленной этиологии	181 000	3 017	107 740	1 795	53 500	87.37	53 500	87.37	53 500	10.0	53 500	10.0	-0.01		
6	Острые кишечные инфекции установленной этиологии	280 000	4 600	150 000	2 500	70 000	113.33	80 000	133.33	70 000	10.0	80 000	10.0	-0.01		
7	Виральный гепатит А	100 000	1 667	50 000	833	25 000	41.67	25 000	41.67	25 000	10.0	25 000	10.0	10.0		
8	Виральный гепатит В	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
9	Бруцеллез	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
10	Поллиомелит	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
11	Лептоспироз	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
12	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
13	Корь	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
14	Коклюш	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
15	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
16	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
17	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
18	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
19	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
20	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
21	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
22	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
23	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
24	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
25	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
26	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
27	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
28	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
29	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
30	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
31	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
32	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
33	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
34	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
35	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
36	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
37	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
38	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
39	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
40	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
41	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
42	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
43	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
44	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
45	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
46	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
47	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
48	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		
49	Скарлатина	10 000	167	5 000	83	2 500	4.17	2 500	4.17	2 500	10.0	2 500	10.0	10.0		

"In their epidemiology, infectious diseases reflect the technical, economic, sociopolitical and cultural processes occurring in society," wrote L. V. Gromashevskiy (1965). Particular features of the epidemiology of infectious and parasitic diseases revealed in recent decades are determined by changing social conditions of the population's life, and they have affected the epidemic situation in different regions of the country depending on the level of their economic development. First, a decrease in the proportion of infectious diseases within the overall morbidity structure has been noted. Second, the structure of infectious morbidity (excluding influenza and acute respiratory diseases) has changed, now being characterized by sharply pronounced variations among different regions of the country. The activity of many natural foci of a number of zoonoses (plague, tularemia, tick-borne encephalitis) has been suppressed in response to

preventive measures and economic activity. However, formation of anthropurgic foci of leptospirosis, ornithosis, Q fever and others is observed. Industrialization of livestock farming has led to a decrease in incidence of anthrax, brucellosis and a number of zoonoses in the presence of growth of incidence of salmonellosis, campylobacteriosis, Newcastle's disease and some others.

Unsatisfactory organization of immunizations, which has been aggravated in a number of regions of the country in recent years by a poorer social and political situation and higher mobility of the population, led to a noticeable rate of decrease of the incidence of "controllable" infections (measles) and even growth of the incidence of diphtheria, poliomyelitis and whooping cough. Epidemic outbreaks of diphtheria, the frequency and

intensity of which is rising, accompanied by high mortality, are especially alarming.

The incidence of hepatitis A correlates distinctly with the sanitary and hygienic conditions of certain territories. It is higher in the Northern Caucasian (250.6 per 100,000) and the Eastern Siberian (223.6 per 100,000) regions, and lower in the Northern, Northwestern, Central and Ural regions (110-130 per 100,000). Sharply pronounced differences in the levels of registration of hepatitis B incidence in certain regions of the Russian Federation are also noted. The highest indicators were recorded in the Tuva Republic (131.6 per 100,000), Sakha (63.3) and Kabardino-Balkaria (58.4), while the lowest were recorded in central oblasts of the Russian Federation and Moscow (17.3). Just as pronounced differences in the recorded incidence of hepatitis B are the result of both differences in the approach to its diagnosis and differences actually existing in the epidemic situation. The proportion of recorded cases of viral hepatitis C, D and E was only 0.4 percent of the total number of cases of acute viral hepatitis, which naturally does not reflect the real proportion of these infections, but gives evidence of a low level of laboratory diagnosis.

When coupled with violations of sterilization rules and the low professional competency of personnel, introduction of the wide use of invasive procedures into therapeutic and diagnostic practice is dangerous not only in relation to infection by hepatitis B virus and human immunodeficiency virus, but also in relation to hepatitis C, D and E viruses, herpes viruses, cytomegalovirus etc.

Human diseases with a fecal-oral mechanism of transmission continue to be a serious problem. Each year the number of recorded cases of intestinal infections is

1.2-1.4 million. The largest numbers are associated with acute intestinal infections of unestablished etiology (39.8 percent), dysentery (25.4 percent), salmonellosis (5.5 percent) and others (8.8 percent). As a rule intestinal infections are recorded more often among urban inhabitants (76 percent), while in the case of yersiniosis, urban inhabitants represent 88.5 percent of patients.

In the last 5 years around 6,000 persons suffered typhoid fever in Russia. The overwhelming majority of the patients were revealed during times of confined water epidemics. The highest incidence continues to be recorded in the Dagestan Autonomous Republic.

On the other hand salmonellosis morbidity is associated primarily with consumption of infected food products, among which chicken eggs and chickens have the greatest significance. The highest yersiniosis morbidity occurred in the Northwestern, Far Eastern and Western Siberian regions. A tendency for growth of sporadic morbidity and a certain decline in epidemic morbidity, which was responsible for 50-70 percent of all cases in certain years, can be noted in the country as a whole. Shifting of the morbidity peak from spring to summer is noted. This shift is associated with inclusion of additional transmission factors into the epidemic process—vegetables grown in greenhouses.

Helminthiasis morbidity (records are kept on 12 forms of helminthiasis) decreased in 1986-1990 in Russia as a whole by 29 percent, while the incidence of particular forms decreased from 9 to 57 percent. However, the degree of infection of the population is still high (Table 2). Each year the officially recorded number of helminthiasis patients reaches 2 million. According to expert assessments it reaches 20-22 million persons.

Table 2. Dynamics of Morbidity Indicators for the Principal Forms of Helminthiasis in the Russian Population in 1986-1990 (Institute of Medical Parasitology and Tropical Medicine imeni V. Ye. Martsinovskiy)

Helminthiasis	Morbidity Indicators*					Percent Decline or Growth
	1986	1987	1988	1989	1990	
Ascariasis	166.5	151.9	124.3	107.3	88.2	-47.1
Trichuriasis	22.8	21.9	17.3	13.2	9.8	-57.2
Infestation with Taeniorhynchus	2.7	2.6	2.3	1.8		
Taeniasis	0.37	0.3	0.29	0.27	2.4 ***	-31.4
Hymenolepiasis	6.3	5.5	4.6	4.3	3.5	-44.5
Ancylostomiasis**	1,275	1,129	1,454	1,295	574	
Diphyllobothriasis	26.0	25.4	24.9	19.7	17.7	-31.9
Enterobiasis	1,131.3	1,188.2	1,112.6	1,148.8	1,156.9	+0.7
Echinococcosis	0.11	0.12	0.13	0.11	0.1	-9.1
Strongyloidiasis	0.08	0.07	0.08	0.05	0.05	0.0
Trichinosis	0.15	0.21	0.095	0.15	0.34	+2.6 times
Opisthorchiasis	62.8	63.0	53.3	48.4	36.6	-41.5

*Morbidity indicators are calculated per 100,000 population.

**The number of imported cases is in absolute figures.

***The overall morbidity indicator for Taeniidae infections.

Enterobiasis is the most widespread parasitic disease infecting children. In this case around 20 percent of children attending preschool institutions fall ill each year.

Parasitic invasion dominates among peoples of the North, Far East and Northern Caucasus. According to data from expeditionary research the incidence of echinococcosis in the Sakha Republic is 38.4 per 100,000 population, while in the group of Vilyuy River rayons it is 150 per 100,000 population. Alveococcosis occupies a leading place in the morbidity structure of the population of Kamchatka, while opisthorchiasis does so in Tyumen and Tomsk oblasts. New foci of diphyllorhynchiasis in which up to 30-40 percent of the population is infected have formed at the Krasnoyarskoye, Bratskoye and Kamskoye reservoirs. It should be emphasized in this case that parasitic diseases promote development of a number of serious somatic diseases. Thus the incidence of bile duct cancer, primary liver cancer, sugar diabetes and so on increases by several times on the background of opisthorchiasis.

Vaccinations are still not being carried out in Russia against German measles, which is naturally helping to keep morbidity high. Each year an average of 340,000-350,000 cases have been recorded. The danger of this disease lies in the fact that when the German measles virus circulates intensively in the population, a high degree of risk of infection of pregnant women exists, which in turn leads to congenital developmental defects of the fetus.

Planned vaccination against epidemic parotitis led to a steady decrease in the incidence of this infection, which still remains impermissibly high—up to 100.0 or more per 100,000 population.

The importance of meningococcal infection is determined primarily by the high mortality rate (averaging 17 percent) in the presence of relatively low morbidity (5.6 per 100,000). The meningococcus serological group A, which had dominated in Russia in previous years, has now been superseded by meningococcus serological group B. Analysis of the epidemic situation with regard for the population's immune status permits us to predict a new possible increase in morbidity by as early as 1993-1995.

The incidence of epidemic typhus and Brill-Zinsser disease is currently insignificant (0.01 per 100,000 population). However, despite the apparent well-being, the danger of the spread of typhus is increasing in connection with quickly progressing growth of pediculosis. Records have been kept on pediculosis as an independent infectious form since 1987. Since that time the indicators for lice infestation (especially by head lice) of the Russian population increased by five to six times to 58-343 per 100,000 population. Preschool and school-children as well as transients are in the risk groups for pediculosis.

The description of the epidemic situation in the country with respect to infectious pathology would be far from complete without a mention of the vast group of diseases brought on by conditionally pathogenic microorganisms. On the backdrop of a poor ecological situation that brings about a decrease in the immune status of the population, this group of diseases, which is not subject to mandatory registration, presents a serious danger to public health. It should be emphasized that even infections contracted within the hospital are caused for the most part by microorganisms classified as conditionally pathogenic. Their etiological diagnosis is highly difficult primarily in connection with the absence of an adequate laboratory base. This circumstance also explains the significant number of infectious diseases of unestablished etiology. Thus the true number of patients with Legionnaire's disease, microplasmosis, Q fever, chlamydiasis and many other diseases, primarily viral infections, is unknown. For example associates of the Virology Institute imeni Ivanovskiy conducting expeditionary research diagnosed 243 cases of diseases of the California encephalitis group, which had not been recorded formerly in Russia. Selective studies reveal significant spread of borreliosis, pneumocystosis, campylobacteriosis, a large group of arbovirus infections and a number of other diseases, the etiology of which cannot be determined as yet by practical public health.

The fast rate of political and economic changes occurring in the former USSR and in the Russian Federation destabilized the epidemic situation in a number of regions. The number of refugees has increased to an unprecedented level, and interruptions in the supply of good quality water and food are now occurring. All of this points to a greater danger of the spread of infectious diseases, and it is the duty of all medical workers to be ready for this. Health is one of the main conditions of Russia's economic development.

COPYRIGHT: Izdatelstvo "Meditsina", 1992

Kazakhstan: Medical-Environmental Atlas Published

93WN0437Z *Almaty AZIYA INTERNATIONAL WEEKLY in Russian* No 16, Apr 93 p 4

[Interview with M. Ishamkulov, head of Department of Industrial Soil Pollution of the Institute of Soil Science of the Academy of Sciences of the Republic of Kazakhstan, by Z. Korneyeva; place and date not given: "Medical-Environmental Atlas of Kazakhstan. Unique Phenomenon"]

[Text] An analysis was made of the incidence of eye diseases among children in Akmoypinsk and Kochetav oblasts. Every fifth child there suffers with myopia. It was revealed that this is associated with underground water rich in radon. Excessive radon is affecting the children's eyesight.

My interlocutor, Marat Shaydulovich Ishamkulov, is a doctor of geographical sciences, head of the Department

of Industrial Soil Pollution of the Institute of Soil Science of the Academy of Sciences of the Republic of Kazakhstan. In the beginning of April, Marat Shaydulovich introduced the "Medical-Environmental Atlas of the Republic of Kazakhstan" at the Ministry of Ecology and Biological Resources. "A unique event and a titanic work," is how it was described by Minister Svyatoslav Aleksandrovich Medvedev. The atlas contains tens of maps from which, for instance, it is possible to find out about the link between certain diseases and the climate or industrial pollution.

[Korneyeva] Marat Shaydulovich, what sections does the atlas contain and who participated in its compilation?

[Ishamkulov] The atlas contains such sections as "Population" (demographic and labor resources) "The human habitat" (pollution of the environment—the longest chapter in this section). "Food," "Nosogeography" (maps of the most prevalent epidemic diseases), "Analysis of Medical-Ecological Consequences of Anthropogenic Influences," "Improvement of the Habitat," "Organization and Planning of Public Health." The Institute of Soil Science of the Academy of Sciences of Kazakhstan, the Ministry of Geology and Protection of Mineral Wealth, Ministry of Ecology and Biological Resources, the Main Administration of Hydrometeorology and Control of the Natural Environment, the Ministry of Public Health as well as others took part in the preparation of the atlas. The atlas has two editors: Mikhail Yefimovich Zeltser, doctor of medical sciences with the Institute for Postgraduate Training of Doctors, and myself.

[Korneyeva] You cited eye diseases among children linked with the presence of radon in water as an example. There are probably quite a few cases of that?

[Ishamkulov] Retinoblastoma is a congenital malignant tumor in children. Cancer of the eyes. It turned out that retinoblastoma can also be an acquired disease. One of the principal sources of this disease is found in a plain, in the foothills of Zailiyskiy Altai, that is a region extending from Chemolgan to Issyk in the west and east; in the south from the area where the mountains begin; and in the north from the Kapchagaysk water reservoir. Almaty also forms a part of that zone. Incidences of that disease are particularly frequent in those sectors where ground water surfaces and processes involving formation of swamps are taking place, with moisture-loving plants, in areas where so-called meadow soil forms. In accordance with research conducted by the Institute of Soil Science soil and plants in this territory are polluted with an excess of fluorine. There is much iodine present there but iodine in all of the environments is in a bound state.

By the way, Almaty and the entire territory of Northern Tien Shan, in the foothill regions, is a zone of iodine deficiency. Basedow's disease occurs here as well as endemic goiter. This has been known since the last century. Not only the foothills of Zailiysk Altai, but also Dzhungarsk Alatau and the Sarkand Rayon are known as

endemically unfavorable. Individual settlements, where the Uigur population lives, it appears, are stricken more frequently apparently by virtue of the peculiarities of the Uigur diet. Their diet includes a lot of vegetables, but iodine in the soil is in a bound form and is not accessible to plants. There is also an insufficiency of iodine in water. This is indicated in our atlas in the form of maps of endemic goiter disease. There are also other very poor areas in the republic. In particular, in West Kazakhstan there is a shortage of selenium both in soil and water, as well as in plants.

[Korneyeva] What diseases are the most prevalent in Kazakhstan?

[Ishamkulov] There are many of them. Among cardiovascular diseases is ischemic disease of the heart, among oncologic diseases is cancer of the esophagus, and among the eye diseases is glaucoma. Blood diseases are also quite common.

[Korneyeva] Marat Shaydulovich, your atlas contains a section "Improvement of the Habitat." That means with the aid of the map it is possible to predict the distribution of a certain disease and issue recommendations for improvement of health conditions?

[Ishamkulov] Yes. But inasmuch as we were unable to cover all of the aspects of habitat improvement, we did it selectively using individual diseases as an example. Endemic goiter, for instance, is affected by iodine deficiency; thus maps were created showing correction of iodine content in various elements of the natural environment with the addition of iodine to salt and to food products, wherever that is necessary.

[Korneyeva] Who is interested in your elaborations?

[Ishamkulov] An entire series of ministries and higher educational establishments for the training of students. For purposes of international exchange, particularly in border regions. How, for example, does a certain disease move to neighboring states, to China, or Iran?

[Korneyeva] The minister called your atlas unique. Has such work been done in other close or distant foreign countries?

[Ishamkulov] Such atlases have not been created in any country. In Moldova, for instance a doctoral dissertation was defended on medical-geographical maps of Moldova by Feldman. But no atlas was created. There was an atlas on the organization and planning of public health in Armenia. But the territory of Armenia cannot be compared with that of Kazakhstan. Their atlas contains maps for the planning of public health in Armenia, showing the network of pharmacies, accessibility of medical services, and number of beds for various diseases. Medical-geographical atlases were created in Russia for Karelia, but they are not as good as our atlas because for the most part they contained a collection of statistical data: incidence of various diseases in the different rayons. We, however, show not only the

number of those suffering diseases, but also why they are sick—as a result of natural causes or due to industrial pollution. In France, for instance, there is the Institute "Maps of the Flora of France," which has been in operation for 20 years. They are yet to complete the mapping of the flora in that country. In Uzbekistan there were also plans to create a medical-geographical atlas but on the basis of a much narrower program. They did not include data either on nutrition nor on improvement of the habitat or on pollution, but merely the principal diseases. That work has not been completed.

[Korneyeva] And your atlas?

[Ishamkulov] We need a good map printing plant for the publication of our maps. Unfortunately there is no such enterprise in Kazakhstan. Those maps which we submitted at the presentation were printed by a very small map printing enterprise belonging to the Ministry of Agriculture. In general that is a major problem. The preparation of such an atlas costs a lot of money which we do not have today. I was once invited to meet with representatives of the Tashkent Map Printing Plant. They came here and we were planning to order the production of maps for our atlas with them. For 20 pages they asked one-and-a-half million rubles. That was the year before last. We have about 138 such pages and at present all this will cost much more. We are seeking sponsors and can promise that our work, in addition to everything else, may yield a substantial profit.

Demographic Trends in Kazakhstan

937C0282A *Alma-Ata ZHAS ALASH in Kazakh*
29 May, 93 p 3

[Interview with demographer Maqash Tatimov, recorded by Meyramtay Imanghaliyeva: "Fourth Child"]

[Text] The fourth child. To be sure, this is not the first child of a household, and it is doubtful if this child will become heir. However, we will begin the thrust of our discussions with our people's demographer, scientist Maqash Tatimov, with the question of the fourth child. Why? Indeed, why are we not going to talk about the first child which will be a future mother, if it is a girl, the heir to the household, if it is a boy, but instead about the fourth child? What unspoken secret is there about the fourth child, what tale is to be told? We offer the discussion below to readers interested in solving this problem.

Imanghaliyeva: You have written a number of articles about the fourth child. Please go into more detail for the readers of our newspaper about the secret of that fourth child.

Tatimov: The fourth child. At first glance the phrase appears to have no meaning but the facts of the matter are altogether different. Only the fourth child of every family can guarantee the growth of our people. For that reason the fourth child has a great deal of meaning for

the people. Our people is a people which has repeatedly suffered in its past history the fate of being "killed a thousand times and revived a thousand and one." However, for many centuries the growth of our manly, heroic people, which has defended people and land from outside enemies with the tips of spears and the strength of its arms, has surprised us. For that reason, we must explain in detail the meaning of the fourth child for our people and make people understand.

I have here in my hand a complete table of demographic fundamentals. According to the table it is calculated that a woman who limits herself to one child has "stolen" two children from her people's numbers while a woman who limits herself to only two children has not "provided" a child to her people's numbers. If the third child, on the other hand, compensates for deficiencies then women who have not had any children at all are reducing our already small numbers by three children. Thus, only the fourth child adds a single child to our growth and raises a single person.

In simple terms this situation must be understood in this way.

The first child, if it is a son, only replaces the father, the second child, if it is a girl only the mother. The third child, however, compensates for the various losses which the people have suffered, that is to say, the third child is born as an offering of the mothers. Our people's numbers neither grow nor decrease because of that third child, only the fourth child, as stated above, adds a number of our people's growth. For that reason the fourth child must be something which every Kazakh mother takes upon herself for the people. If the chain goes on, and the fifth child is brought into the world for the fatherland, the sixth for the satisfaction of the spirit of blue heaven, only the seventh child speeds up rapidly the rate of our people's demographic growth.

Only in this way can be paternal spirit, which has come down from Adam and Eve, the first father and mother, give pleasure to Kazakh women.

At present the average number of children born for Kazakh women is only 3.5. During the years 1958-59, that is, during the time of demographic explosion, every Kazakh woman brought into the world an average of seven children. Thus, in 35 years the rate for average number of children born has fallen to half of what it was. What is the reason? In fact what is responsible for everything are difficult economic circumstances and our people's declining standards of living. As a consequence of these circumstances, we began to limit the number of our children to one to two.

However, what mother did not have the good intention that "we will have 4-6 children if our lives get better and if the situation is set to rights." This means that women, on the average, eliminated 1.1 children on account of such difficulties. According to general statistics for 1988, Kazakh women bore 209,000 children. However, the figure fell to 206,000 in 1989, 204,000 in 1990, 203,000

in 1991, and 202,000 in 1992. That is to say, while the birthrate per thousand was 33.1 in 1988, it had fallen to 29.0 in 1992. Thus, our people's rate of natural increase had fallen from 27.0 to 22.4 and at the same time the death rate had risen from 6.1 per thousand to 6.6 in 1992. All of this reflects the harm produced by a hard life and difficult living conditions. During just the last 4 years, our people's rate of growth has abated by now up to 20 percent.

Indeed, one can say that fourth children are for all practical purposes no longer found in the cities. If they are found, they are found in the families of persons aged 40 and above 50, that is to say, among the older generation. Moreover, the number of families with four children has begun to be rare in rural areas. The reason is that the wrong idea that "two or three children are enough" has become established among present-day Kazakh young people. This has grown out of the wrong and lazy conclusion that "we will look out for ourselves, and the hell with everyone else."

In truth, it is not an easy thing to exceed six or seven children in this era when it is a struggle just to survive, leaving aside other things. To be sure. However, every thinking Kazakh young person, concerned about the decay of its own people and having great feeling for their people, must struggle together for the fourth child and, if things subsequently improve, must think about bringing into the world the fifth, sixth and seventh... children.

Imanghaliyeva: At what age should women have their fourth child?

Tatimov: According to 1991 research, 24,728 women delivered a fourth child in the republic. This figure comprises only 7 percent of all children born in Kazakhstan. Fourth children are very rare in the city, not 5 percent, but the figure is much higher in rural areas, 9 percent.

Indeed, let us get to the root of the matter. Among the women having fourth children, just two were under twenty, 1,382 were aged 20-24, 9,320 were aged 25-29, 9,920 were aged 30-34, 3,549 were aged 35-39, 523, were 40-44, and 19 were aged 45-49.

Judging from this, women between the ages of 30 and 34 bear most of the fourth children. This is altogether to be expected.

Imanghaliyeva: Why do we say so much about the fourth child? Why do we not say something about the first child?

Tatimov: The first child comes into being whether one is married or not, no one cares, and they continue to come into being. This is because it is the child of irrepressible, red-hot love. As stated above, first children play no role in the growth of the people. The growth of the people is in the hands of the fourth child.

Imanghaliyeva: How many women are there in Kazakhstan having fifth and sixth children..., above the fourth?

Tatimov: According to information for 1991, the number of women in Kazakhstan having a fifth child was 12,195, and the number of women having a sixth child 5,370, a seventh child, 2,565, an eighth child, 1,301, a ninth child, 715, a tenth child, 667. There is the remarkable proverb among the Kazakhs that a "house with children is a bazaar, a house without children a graveyard." To be sure, just as the proverb says, what is more wonderful than the joy of a bazaar, a festival each day!

Imanghaliyeva: Do children born to unmarried mothers play a role in the growth of the people?

Tatimov: Before I talk about the birth of children to unmarried mothers, I would like to offer a few statistics. In 1991, 100,000 Kazakh women had abortions and measures were taken so that 50,000 Kazakh women did not give birth. That is to say, they had loops inserted. However, this year 47,531 children came into the world to unmarried mothers in Kazakhstan. Of them, 27,726 were born in urban and the remaining 19,805 in rural areas. This means that 13.4 percent of children born during the year were born to unmarried mothers, that is to say, that every seventh or eighth child born was born to an unmarried mother. Children born to unmarried mothers are 11 percent for rural areas but are up to 16 percent in urban areas. The areas of predominate Russian residence are the highest in the republic in percentages of illegitimate birth, namely, Pavlodar Oblast, with 20.4 percent, Alma-Ata city, 19.9 percent, Kustanay Oblast, 19.0 percent. Those areas with the lowest rates of illegitimate birth are areas primarily occupied by Kazakhs, for example, Kzyl Orda, 7.5 percent, Chimkent, 7.5 percent, Mangistau, 7.6 percent. Moreover, the figure is 1.8 percent in rural areas of Mangistau, 4.1 percent in rural areas of Kzyl Orda Oblast, 3.8 percent in rural areas of Atyrau Oblast, and 5.7 percent in rural areas of Southern Kazakhstan Oblast. These are 4-5 times lower than the highest figures. However, illegitimate children born among Kazakhs are only one half as numerous as illegitimate children born among Russians. More specifically, the figures are 19-20 percent for Russians, 8-9 percent for Kazakhs. This is to say that 16-18,000 of the 202,000 Kazakh children born in 1992 were illegitimate.

However, this is a very high rate for a people which did not know what illegitimate birth was in its history. The bearing of an illegitimate child means that the woman guards the cradle and has a burden. This in particular is something not good. Our people knows this sort of thing as "having a notch on one's backbone." For this reason our people says nothing about "the indiscretion of girls."

Imanghaliyeva: You have written in some of your research articles that our old women are increasing in numbers. In terms of this, what do you think about polygamy?

Tatimov: Indeed, I have mentioned repeatedly that according to the results of the 1989 Census, there were 88,000 "old women" between the age of 25 and 45 among Kazakhs in the republic who had never married or who had never become pregnant with even a single child. I still say this. If we follow the proverb: "there is a place for the sitting woman," I have no doubt that this figure, if it does not increase still more at the present time, will be reduced.

Who is responsible that so many women have formed no families and have raised no children in a Kazakh people of 110,000 in all. Society? To be sure. Where are the close sisters-in-law rushing about for the wife's elder sister? Where are our concerned contemporaries saying: "let us be match-makers for one another." Where are the sisters-in-law who are concerned about the fate of their nieces? Are we not thus recognizing our "old women" as our involuntary thieves? This is because they are stealing, as noted above, three children from the people's numbers.

What must we do in the future about this? We must make it possible to take two wives (leaving aside, for the time being, the issue of many wives). I am not against this. There is no need to be against it.

The times are now changing. It is the time of the powerful, of the strong. There are powerful industrialists and well-financed businessmen in the flow of things. Who can guarantee that they will not take two or three wives or more? Has not the time come where it is said: "if a Kazakh gets rich, he takes a wife."

For that reason, there is no need to be against renewal of the ancestral custom of polygamy. To achieve this legal permission must be given and the old laws set aside. For example, we must strike article 208 of the Civil Codex on Family and Marriage of the Republic of Kazakhstan. It is stated there that a man taking two wives will be sentenced to prison for up to 2-3 years. Only in this way will we solve the "old woman" problem and get out of our difficulty. I note by way of follow-up that those in the West in a similar situation have gotten out of the difficulty themselves. Even if they have had only one child for themselves, in our demography they have joined the ranks of mothers.

Imanghaliyeva: Our paper is primarily directed at young people. Do you not have facts in your hands about young mothers in this connection?

Tatimov: Are our women aged under 20 with children young mothers? In 1991, 38,706 children were born to mothers under 20. Some 11 percent of the children born in that year were born to young mothers. If we go into

detail with regard to this figure the results are as follows: 272 of the 38,706 children were born to mothers under 16, 1,245 to mothers 16, 4,505, to mothers 17, 12,062 to mothers 18, and 20,622 to mothers 19.

The areas with the highest birth rates for young mothers were: Northern Kazakhstan, Eastern Kazakhstan, and Pavlodar Oblasts, 15 percent. The areas with the lowest birth rates for young mothers were: Southern Kazakhstan, Mangistau, Kzyl Orda, and Atyrau oblasts, 6-7 percent.

Indeed, I think that our girls deeply understand that love and parenthood are something natural.

I would like to state that, just at this time, my dear, there is a close connection between mothers performing their honored duty and preservation of our mother tongue. We must not think that bringing a fourth child into the world or not bringing a fourth child into the world is simply a matter of pursuit of numbers or a purely demographic question. The growth of quality is based upon numbers. If children born are not 4 but 7, or even 10, and the mother does not teach them her tongue, they will not be educated as proper citizens of our nationality. What use are hybrids or mixed-bloods to us?

We can only preserve our mother tongue by bringing it into contact with the power of the mother. This is because the primary reason why the Kazakh language has been lamed and the linguistic environment disturbed is due to the great shaking, in its time, of the demographic foundation stone. For that reason we can only save ourselves from a situation where the Kazakh linguistic environment has become one of scarceness and restore an environment of density in the future through demographic growth and, relying on this, through development. Speakers of the Kazakh language are not even two-thirds of the citizens of our young nation and there is no possibility for making things better for our mother tongue and raising its status. Whatever laws are enacted, whatever committees established, the fate of our language will be decided at the living demographic front. I may say in conclusion that I would like to repeat, as a major dictum, the fact that a mother tongue must be cultivated with the strength of mothers. The fate of the Kazakh language will only be decided by the fourth children coming to life in Kazakh families. We must know how to struggle for this.

Imanghaliyeva: A last question. You have done everything possible and argued for the sake of children. How many children do you yourself have?

Tatimov: I have five children. The oldest is a girl of 23, the youngest a son of 8.

The Integrality of Individuality and the Effect of Radiation on Activation of the Brain

937C0231A Moscow PSIKHOLOGICHESKIY
ZHURNAL in Russian Vol 14 No 2, Mar-Apr 93
pp 25-34

[Article by T.F. Bazylevich, V.G. Aseyev, M.V. Bodunov, O.V. Guseva, and I.V. Kobazev]

[Abstract] The effect that individual peculiarities of the psyche have on the development of radiation injury must be studied in order to fully understand the mechanisms of the effect of low doses of radiation on humans. Specialists have noted that different people react differently to exposure to radiation and have demonstrated the syndromal nature of the psychotraumatic stress that follows radiation accidents such as the one at the Chernobyl Nuclear Power Plant [Chernobyl AES]. In view of these facts, a study was conducted to identify the mean group indices of nonspecific activation of three groups of people. The first group consisted of 13 males involved in clearing the accident at the Chernobyl AES, the second group consisted of 21 inhabitants (12 males and 9 females) of the Bryansk Oblast who resided on land where low doses of radiation had been recorded, and the third group consisted of 13 persons (8 males and 5 females) from areas of the Bryansk Oblast that had not been affected by radiation from the Chernobyl accident. EEGs of each of the study subjects were recorded from 16 monopolar leads and were then analyzed in accordance with the standard spectral analysis procedure. The average spectral power in three frequency ranges, i.e., theta-1 (4-6 Hz), theta-2 (6-8 Hz), and alpha (8-13 Hz), served as an index of the characteristics of the psychophysiological level of individuality. The students' t-test and analysis of variance were used to compare the indicators' mean group values. A questionnaire adapted

to methods characterizing the formal-dynamic aspect of behavior was used to evaluate the psychodynamic distinctions of each participant's individuality. The motivation-need aspect of personality was also studied. A comparison of the mean group characteristics of different ranges of bioelectric brain activity demonstrated a rather similar pattern among all three groups for all leads and evaluated frequencies. The greatest shifts in EEG indicators occurred among those study subjects who resided permanently under conditions of elevated radiation levels, even though the said levels are considered absolutely safe for living organisms by independent experts from the International Atomic Energy Agency (IAEA). This finding was taken as evidence of the importance of psychological factors in the human response to radiation. The fact that the persons involved in actually clearing the Chernobyl accident (and thus receiving higher, albeit shorter-term doses of radiation than the permanent inhabitants of the region with elevated radiation levels) manifested lesser shifts in EEG activity was attributed to the compensatory capabilities of persons actually involved in an activity. The motivation-need studies revealed that most of the individuals subjected to ionizing radiation now prefer two types of behavior: routine actions not requiring any special mental energy expenditures and actions designed to protect their children from the consequences of radiation. Most of these individuals have become more passive (both emotionally and physically). This syndrome has been classified as a weakening of the nervous system manifested in a decrease in energy against the background of an increase in neuroticism. The fact that the persons involved in clearing the accident were actually less affected by the accident than the residents of the radionuclide-contaminated territory was cited as evidence of the importance of taking an individualized approach to persons suffering a catastrophe. Figures 4, tables 4; references 22 (Russian).

Insulin Level Alteration Due to Burns and Combined Radiation Injury and Burns and the Insulating Activity of Medium-Molecular Weight Blood Peptides

937C0249A Moscow VOPROSY MEDITSINSKOY

KHIMII in Russian Vol 39 No 1, Jan-Feb 93

(manuscript received 9 Oct 91) pp 16-18

[Article by V.Ye. Ryabinin and R.I. Lifshits, Chelyabinsk Medical Institute; UDC 616.001.28+616.001.17]-07:[616.154:577.175.722]

[Abstract] A study examined the effect of thermal trauma and combined thermal and radiation injury on blood insulin levels and the insulin-modulating effect of medium-molecular weight blood peptides. Three groups of 12 mongrel white mice each were studied. A halogen-quartz lamp was used to inflict thermal burns on 10-12 percent of the bodies of the mice in the first group. The mice in the second group were also inflicted with third-degree thermal burns. In addition, before being burned, the mice in the second group were irradiated (on an IGUR unit) with ^{137}Cs in a dose of 3.4 Gy at a dose rate of 1 cGy/s. The third group of mice were kept unharmed as healthy controls. The medium-molecular weight components of the mice's blood plasma were separated by sequential ultrafiltration. The ultrafiltrate was then concentrated, applied to a column with G-15 Sephadex, and then eluted with distilled water. The insulin content of the blood of the experimental and control animals was then determined by the radioimmune method by using sets produced by the Minsk Bioorganic Chemistry Institute. The glucose content of the animals' blood was determined by the hexokinase method. One day after the rats were burned, the concentration of glucose in their blood plasma increased significantly in comparison to that of the control rats (10.2 \pm 0.8 mmol/l versus 4.6 \pm 0.3 mmol/l). By day 3, the burned rats' level of hyperglycemia decreased somewhat (7.1 \pm 0.8 mmol/l); however, their glucose concentration increased once again (to 9.6 \pm 0.6 mmol/l) on day 7. The blood insulin levels of the burned rats also increased significantly. Combined thermal and radiation injury resulted in a positive increase in blood insulin concentration 1 day after the trauma and in a gradual decrease in insulin content by day 14 of the experiment. The most biologically active of the medium-molecular weight peptides fractions isolated from the blood of the mice in the experimental and control groups were injected intravenously into mice (in amounts of 2-3 $\mu\text{g/g}$). Twenty minutes after the injections, the level of immunoreactive insulin in the animals injected with the medium-molecular weight peptide fractions taken from the healthy animals and the animals with thermal burns alone remained within normal limits. The immunoreactive insulin levels of the animals injected with the medium-molecular weight peptide fraction from the mice that had been subjected to the combined thermal and radiation injury, on the other hand, more than doubled. The studies performed thus confirmed that during the toxemia period, both the immunoreactive insulin level and the medium-molecular weight peptide content increase with burn severity. Special experiments in which, instead of the study blood, increasing concentrations of the study

medium-molecular weight peptide fractions from the blood of the burned animals were added to standard incubation medium to determine immunoreactive insulin level confirmed that medium-molecular weight peptides are potentially capable of interacting with insulin receptors. All of the medium-molecular weight peptide fractions had a nearly equally affinity to insulin antiserum. This in turn confirmed the fundamental possibility of the competitive interaction of endogenically formed medium-molecular weight peptides with insulin for cell membranes' receptor sites. The magnitude of insulin resistance in specified periods of illness resulting from thermal burns and from combined thermal and radiation trauma may thus be a direct function of the level of medium-molecular weight peptides in the blood. Hemocarboperfusion to eliminate medium-molecular weight peptides together with intravenous injection of glucose with insulin hypercorrection to eliminate competitive inhibition of insulin receptors by medium-molecular weight peptides appears a sound way of correcting this state. Figure 1, tables 3; references 15: 10 Russian, 5 Western.

Estimating the Activity of Acetylcholine Transferase in Cardiac Tissue

937C0249B Moscow VOPROSY MEDITSINSKOY

KHIMII in Russian Vol 39 No 1, Jan-Feb 93

(manuscript received 19 Sep 91) pp 25-29

[Article by S.V. Trishkin, V.A. Kuznetsov, and K.B. Vinnitskaya, Scientific Center for Surgery, Russian Academy of Medical Sciences, Moscow, and Moscow Medical Academy imeni I.M. Sechenov; UDC 612.17.015.1:577.152.2]-08]

[Abstract] Acetylcholine transferase activity is currently determined by radiometric analysis. A modification of the radioisotope analysis technique described in publications of Fonnum, Tucek, and Slavikova and Tucek was proposed. The modification was based on replacing separation of the substrate ^{14}C -acetylcholine transferase and the product of the enzyme reaction ^{14}C -acetylcholine (using extraction by a solution of sodium tetraphenylborate in an organic solvent) by anion-exchange chromatography. The main stages in the development of the modified technique were as follows: selection of a counter ion form of resin, determining the volume of resin and eluting liquid, determining the magnitude of the backgrounds and specificity of the reaction, determining the dependence of the activity of acetylcholine transferase on the degree of separation, determining the kinetic characteristics of acetylcholine transferase in the ventricles and auricles, and comparing the effectiveness of the new method versus that of the Fonnum-Tucek method. The effectiveness of the new method was tested by studying cardiac tissue of male Wistar rats (weight, 150 to 250 g) under conditions of hyperbaric oxygenation, simulated myocardial infarction, and moderate immobilization stress. The new procedure proved to be five times more effective than the Fonnum-Tucek technique. Analysis of the dependence of acetylcholine transferase activity on the duration of incubation of the cardiac tissue homogenates established that an auricle tissue incubation time of 200 minutes and a ventricle tissue incubation time of 40 minutes are optimum.

The analysis also established that acetylcholine transferase activity is a linear function of homogenate concentration ($r = 0.9975$). The new technique offers several advantages over the Fonnum-Tucek technique: The new technique can be implemented in a single stage without any need to use a centrifuge, work with organic solvents, or use hard-to-obtain sodium tetraphenylborate. The studies confirmed that the new technique for estimating acetylcholine transferase activity in cardiac tissue is a highly sensitive means of recording the change in the functional state of cardiac acetylcholine transferase and the functioning of the cholinergic system as a whole in diverse pathophysiological situations determined by the functional state of individual molecular components of the cholinergic system. Figures 6, tables 3; references 20: 5 Russian, 15 Western.

Activation of Free-Radical Processes as a Factor of Ionizing Radiation-Induced Alterations in Contractile Activity of a Vascular Wall

937C0272A Kiev *FIZIOLOGICHESKIY ZHURNAL* in Russian Vol 39, No 2-3 93 (Signed to press 3 May 93) p 23

[Abstract of article by S. M. Tyshkin, V. M. Taranenko, M. I. Rudnyev, G. S. Voronkov, G. I. Plyushch, I. M. Isayechkina, L. M. Popova and V. V. Bratus, UDC 616.13-001.28:612.014.482]

[Text] The effect of exposure to ionizing radiation from a ^{137}Cs source (1, 2 and 4 Gr) on the activity of free-radical processes in plasma, formed blood elements and tissue of the aortic wall and upon the nature of contractile vascular reactions of ring segments of the thoracic part of the aorta and the carotid artery of the rabbit was studied. It is shown that by as early as the 7th day after exposure (1 Gr), a tendency for a decrease in endothelium-dependent and endothelium-independent dilatory reactions of the vascular wall arises in parallel with weakening of protective antioxidant mechanisms. When the exposure dose of ionizing radiation is increased to 2 and 4 Gr, significant weakening of endothelium-dependent dilatory reactions, a decrease in relaxation of smooth-muscle cells in response to the direct action of nitroglycerine, and growth of the sensitivity of vascular preparations to constricting influences on the backdrop of an increase in activation of free-radical processes are observed. Changes in the functional properties of the vascular wall develop right during the initial period of the aftereffects of exposure to ionizing radiation, with radiation injury affecting endotheliocytes and smooth-muscle cells of vessels. Presence of a distinct correlation between changes in reactivity of the vascular wall and the state of free-radical processes permits the hypothesis that a leading role belongs to the latter as a factor altering the functional properties of vessels in the presence of ionizing radiation.

COPYRIGHT: Izdatelstvo "Naukova dumka", "Fiziologicheskii zhurnal", 1993

Intake of Iodine-Containing Water and Radiosensitivity of Rats

937C0276C Moscow *VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KULTURY* in Russian No 2, Mar-Apr 93 (manuscript received 21 Dec 92) pp 47-48

[Article by Yu.N. Korolev, L.A. Nikulina and S.M. Zubkova, Russian Scientific Center for Rehabilitation and Physical Therapy, Moscow; UDC 615.838.97.015.4.076.9]

[Abstract] Impact of iodine ion concentration on radioresistance of 150 g outbred rats was assessed vis-a-vis 4.2 or 5.0 Gy gamma irradiation. In the 4.2 Gy experiment survival with intake of tap water (3 ml/day for 21 days) was 85% with a mean survival span of 27.5 days. Natural mineral water (14 mg/L I⁻ concentration) and water supplemented with iodide (49 mg/L) yielded identical respective figures of 95% and 29.3 days. In the 5 Gy study the corresponding figures for tap water were 84% and 26.9 days, for natural mineral water 88% and 28.9 days, and for supplemented water 96% and 29.2 days. These findings point to the utility of nontoxic natural I-containing water as radioprotective agent which may be taken for prolonged periods. Possible protective mechanism may rest on reduced peroxidation of membrane lipids in the liver and enhanced mitochondrial phosphorylation. Tables 1; references 6: 5 Russian, 1 Western.

Condition of Hypothalamo-Hypophyseal-Adrenal Systems in Chernobyl Accident Clean-up Participants With Neurocirculatory Asthenia

937C0262A Moscow *TERAPEVTICHESKIY ARKHIV* in Russian Vol 65, 93 No 2 93 [Signed to press 27 Jan 93] pp 58-62

[Article by A. N. Kovalenko, V. A. Sushko; UDC 616.12-009.86-07 :[616.831.41+616.432+616.45]-02:614.876]

[Abstract] Individuals who participated in the clean-up at the Chernobyl Nuclear Power Station and who received external and internal doses of radiation are used for the basis of the study. As a result of their exposure, these individuals are suffering from neurocirculatory asthenia. The condition of their hypothalamo-hypophyseal-adrenal systems, and the reaction of these systems are the focus of the study. The subjects were divided into two groups. The first group displayed functional disorders in the form of the neurocirculatory asthenia syndrome. The second group had neurocirculatory asthenia syndrome and was diagnosed in the post-accident period as having chronic illnesses of the internal organs which had not been recorded previously. Individuals who were virtually identical to the subjects in the study in terms of their age, sex and occupation were used for the purposes of comparison. Clinically speaking, this comparison group was similar to the subjects in group two, however, none in the comparison group displayed symptoms of neurocirculatory asthenia. A control group was also used in the study. It consisted of healthy men who had only been exposed to the natural radiation background. The

activity of the hypothalamo-hypophyseal-adrenal systems of all groups was studied by determining the level of adrenocorticotrophic hormones and hydrocortisone in blood serum. An adrenal test was also performed. The results of the testing are presented. The observations resulting from the testing are important from the standpoint of radiobiological analyses of mechanisms of individual radiosensitivity (radioresistance), upon which the problem of professional screening is based. 1 table, 2 graphs and 18 references.

Hematologic Five-Year Follow Up of Chernobyl Cleanup Workers

937C0242A Moscow *GEMATOLOGIYA* 1
TRANSFUZIOLOGIYA in Russian Vol 38 No 3,
Mar 93 (manuscript received 28 Oct 91) pp 30-33

[Article by V.P. Mishchenko, prof., N.N. Gritsay, A.A. Litvin, V.N. Sokolenko, O.I. Tsebrzhinskiy, L.A. Kutsenko, N.D. Narizhnyuk, A.S. Fadeyeva, L.V. Berkalo, N.A. Bobrova, A.V. Bodnarchuk, V.I. Kishun, V.Ya. Pankiv,

R.M. Pshik, O.V. Shevchenko and I.A. Solntseva, Central Scientific Research Laboratory and Chair of Normal Pathology, Poltava Medical Stomatological Institute]

[Abstract] Five-year hematologic followup was performed on 60 males engaged in the original Chernobyl cleanup efforts as part of an assessment of ionizing radiation sequelae. Comparative data were obtained for 20 control subjects in the same age bracket (25-40 years). The findings showed a two-fold increase in chromosomal abnormalities in peripheral blood lymphocytes of the exposed group. In addition, blood chemistries revealed elevation of serum cortisol (824.4 nM/L vs. 230-750 nM/L control range), IgM (4.4 vs. 0.5-1.9 g/L) and testosterone (25.9 vs. 2-10 ng/ml). Additional changes observed in the at-risk group consisted of depression of blood peroxidative processes and diminished respiratory burst of neutrophils. These changes were interpreted as reflecting ionizing radiation-induced pathogenetic mechanisms underlying hypocoagulability in the cleanup workers. Tables 3; references 24: 23 Russian, 1 Western.

Ukrainian Law on Veterinary Medicine

937C0268A Moscow *VETERINARIYA* in Russian No 1, 93 (signed to press 21 Dec 92) pp 3-10

[Law endorsed by L. Kravchuk, president of the Ukraine, in Kiev on 25 June 1992; first two paragraphs are *VETERINARIYA* introduction]

[Text] The editorial office has received letters from veterinary specialists stating that readers are interested in development and approval of new veterinary laws in CIS states. We wish to inform our readers that the Supreme Soviet of the Ukraine has resolved to enact a Ukrainian Law "On Veterinary Medicine."

No doubt, publication of this law will be of interest to the veterinarian community and specialists, and will be useful in elaborating analogous laws in CIS states.

Law of the Ukraine on Veterinary Medicine

This law defines general, legal, organizational and financial bases of veterinary medicine. It regulates activities in the field of veterinary medicine in accordance with international requirements, defines the legal status of veterinary science, and defines the necessary veterinary and sanitary requirements, and bases for veterinary oversight.

Section 1. General Statutes

Article 1. Definition of Terms

In this Law, the terminology listed below is used in the following meaning.

Veterinary medicine—the aggregate of steps for the prevention of animal diseases, their treatment, reduction of losses due to diseases, sterility and death, improving the quality of raw materials and products of animal origin, prevention and control of diseases common to animals and man, and recovery of ecologically pure foodstuffs.

Specialists in veterinary medicine—veterinarians, feldshers and technicians in veterinary medicine who implement diagnostic, preventive, sanitizing and therapeutic work in the livestock industry, veterinary-sanitary expertise of livestock products and perform other veterinary services to livestock owners.

Veterinary-sanitary expertise—the aggregate of diagnostic and special tests carried out for the purpose of evaluating the quality of foodstuffs, raw materials of animal and plant origin.

State veterinary oversight—activities of agencies of state veterinary medicine dealing with performance of veterinary requirements in the production, processing, storage and transportation of animals, raw materials and products of animal origin, production and use of immunobiological, biological, plant, chemical, chemical and pharmaceutical agents, as well as adherence to regulations for utilization of dead animals.

Regulations of veterinary medicine—veterinary requirements established in accordance with this Law regulating the activities of physical and legal entities in the area of veterinary medicine.

Resources of veterinary medicine—immunobiological, biological, plant, chemical, chemical and pharmaceutical veterinary agents and feed supplements, as well as other materials essential to veterinary practice and prevention of animal diseases; equipment, instruments, tools, special vehicles, apparatus needed for veterinary medicine.

Animals—livestock, domestic, zoo, laboratory animals and other representatives of the fauna, as well as embryos, fertilized roe, etc.

Products of animal origin—meat and meat products, milk and dairy products, eggs, fish, products of beekeeping, sperm, etc.

Raw materials of animal origin—leather, wool, hair, fur, down, feathers, endocrine glands, intestines, horns, hooves, bones, lungs, liver, other soft sub-products, bile, blood, unrefined beeswax, etc.

Article 2. Principal Objectives of Veterinary Medicine

The following are the main tasks for veterinary medicine:—prevention, detection, treatment of infectious, invasive and noncommunicable diseases of domesticated animals and wild fauna;—monitoring quality, from both the commercial and veterinary standpoints, of products and raw materials of animal origin;—protection of the public against diseases common to animals and man;—protection of the territory of the Ukraine against importation of infectious diseases of animals from territories of other states;—monitoring movement, export and import of raw materials, animals, and products of animal origin;—veterinary-sanitary expertise of products of animal and plant origin;—monitoring quality of production of therapeutic, diagnostic, preventive agents and feed supplements intended for veterinary medicine;—radiological and toxicological monitoring of products of animal and plant origin at markets, meat processing and packing plants, refrigerators and bases where products are procured, stored and sold, etc.;—implementation of independent veterinary-sanitary expertise of products, raw materials and animals, products of animal origin, feed, agents used in veterinary medicine, which are to be exported and imported;—monitoring of adherence of physical and legal entities to veterinary-sanitary requirements aimed at protecting the environment;—introduction of advances in veterinary science.

Veterinary medicine agencies base their activities on interaction with agencies of the national executive branch and administrative agencies of local government, enterprises, institutions and organizations, cooperatives and citizens.

Section 2. Veterinary Practice, Training and Status of Specialists in Veterinary Medicine**Article 3. Right to Practice Veterinary Medicine**

Individuals who have completed the appropriate higher or secondary specialized education are allowed to practice veterinary medicine. A veterinary feldsher (technician) is allowed to engage in entrepreneurial veterinary activities only under the supervision of a veterinarian.

Foreigners and individuals without citizenship who have the necessary qualifications can practice veterinary medicine in the Ukraine in accordance with the laws.

Article 4. Qualification of Specialists in Veterinary Medicine

Graduates of veterinary educational institutions are qualified in accordance with the Ukrainian Law "On Education," as follows, depending on the level and scope of state education:—junior specialist (veterinary feldsher, veterinary technician)—for those who have attended the appropriate tekhnikum of veterinary medicine or schools;—doctor of veterinary medicine—for those who have attended colleges of veterinary medicine, institutes, academies, universities, or other equivalent educational institutions;—bachelor of veterinary medicine—for those who have attended colleges of veterinary medicine, institutes, academies, universities, or other equivalent educational establishments;—master of veterinary medicine—for those who have attended institutes of veterinary medicine, academies, universities, and other educational institutions with appropriate certification.

Specialists in veterinary medicine are trained only at a permanent location [as opposed to correspondence school].

Article 5. Scientific Degrees and Scientific Titles

By decision of the state examination commission, the scientific degree of bachelor is bestowed upon graduates of veterinary educational institutions who have been qualified as bachelors of veterinary medicine on the basis of defense of a qualifying thesis. The scientific degree of master of veterinary sciences is bestowed by decision of the scientific council of a VUZ [higher educational institution] (department) to individuals who have been granted the qualification of master or have a bachelor's degree, and who have defended a scientific qualifying thesis.

Candidatorial and doctoral degrees in veterinary sciences are bestowed by specialized scientific councils of higher veterinary educational institutions or veterinary research institutes.

Academic titles of senior scientific associate, docent and professor are conferred by scientific councils of VUZ's, or research institutes and they are confirmed by the established procedure.

A monetary bonus in addition to the wages set for their job may be awarded to specialists in veterinary medicine who have an honorary title, academic degree of bachelor, master, doctor, candidate or doctor of sciences and are employed in their special field.

Article 6. Advanced Training, Retraining, and Certification of Specialists in Veterinary Medicine

Advanced training and retraining of specialists in veterinary medicine are offered to the following:—veterinarians specializing in infectious, invasive and noncommunicable diseases of animals, specialists in laboratory veterinary medicine dealing with laboratory detection of infectious and other animal pathology—at institutes for advanced training of veterinarians and departments of veterinary medicine at agricultural VUZ's in the Ukraine;—veterinary feldshers, veterinary technicians—at veterinary and agricultural tekhnikums or VUZ's;—general practice veterinarians and veterinary feldshers, veterinary technicians—at educational institutions for advanced training and retraining of personnel.

Specialists in national veterinary medicine are paid for their advanced training at the expense of the state budget for institutions, enterprises and organizations, whereas veterinarians who are working on an entrepreneurial basis pay their own way.

Advanced training is required at least once every 5 years.

Specialists in veterinary medicine must be certified in accordance with the procedure established by the State on Veterinary Medicine of the Ukraine. Conformity of an individual holding a particular job, the level of his qualification, and category classification are determined on the basis of the results of certification, and appropriate wages are set.

Article 7. Social Security for Specialists in Veterinary Medicine

Specialists in veterinary medicine have the right to privatize state property at a state enterprise of their choice, under terms provided for in their service zone for the labor force of the enterprise to be privatized.

The local state administrations, enterprises, institutions, organizations, collective and other farms provide to veterinary specialists the appropriate production and housing conditions, medical services and transportation.

The legislation concerning labor, social security and social insurance extends to veterinary specialists.

Specialists in veterinary medicine are subject to mandatory insurance to cover severe injury or occupational disease sustained while performing their professional duties, in the control of zoonotic diseases and during direct procedures carried out on animals charged to nonbudgetary resources.

In the event of such severe injury or occupational disease, a lump sum is issued to specialists in veterinary medicine equaling 3 to 5 years of wages, depending on the extent of disability.

Veterinary specialists residing and working in their field in rural areas, settlements of the urban type (work settlements) have the right, in accordance with current legislation, to free housing, heat and electricity, preferential credit to acquire a farm, build individual residences and acquire livestock. They are exempt from payment of land tax. Retired veterinary specialists who had been employed in rural areas and reside there retain these rights. Specialists in veterinary medicine are provided with special transportation in their work. If they use their own motor vehicle for business purposes, specialists receive monetary compensation in the established amounts.

Article 8. Incentives for Specialists in Veterinary Medicine

Personal recognition and financial incentives are provided to veterinary workers in accordance with legislation.

The honorary titles of Honored Veterinarian of the Ukraine and Honored Veterinary Worker of the Ukraine can be bestowed upon specialists in veterinary medicine following established procedure.

Section 3. The System of State Veterinary Medicine. Entrepreneurial Veterinary Practice

Article 9. System of State Veterinary Medicine

The system of state veterinary medicine comprises:—a) the Main Administration for Veterinary Medicine including the State Veterinary Inspectorate under the Ukrainian Ministry of Agriculture and Foodstuffs with its subordinate entities: Crimean republic and oblast, Kiev and Sevastopol municipal administrations of state veterinary medicine, Central Laboratory of Veterinary Medicine, zonal specialized laboratories of veterinary medicine dealing with animal diseases, interoblast specialized state laboratories of veterinary medicine dealing with avian diseases, the Ukrzoovetpromsnab [Ukrainian Zootechnical and Veterinary Product Supply] corporation, enterprises producing immunobiological, chemical and pharmaceutical veterinary agents, instruments, equipment, tools, laboratory glassware for veterinary purposes, the State Scientific Research Institute for Control of Veterinary Preparations and Feed Supplements, state veterinary medicine services in railroads and border checkpoints of veterinary medicine, departments of agency veterinary militia for veterinary quarantine measures;—b) Crimean republic and oblast level, Kiev and Sevastopol municipal administrations of state veterinary medicine along with state enterprises (hospitals) of veterinary medicine, oblast cost-accounting veterinary-sanitary and their subordinate oblast and municipal groups ["detachments"], rayon state enterprises (hospitals) of veterinary medicine, oblast and rayon state

laboratories of veterinary medicine, oblast departments of the Ukrzoovetpromsnab corporation, rayon and municipal state "Veterinary Medicine" enterprises operating on a cost-accounting basis, departments of agency veterinary militia to implement veterinary quarantine measures;—c) rayon enterprises (hospitals) of state veterinary medicine with their subordinate district veterinary hospitals, districts, polyclinics, centers, rayon-level state veterinary laboratories and veterinary-sanitary expertise at markets;—d) municipal enterprises (hospitals) of state veterinary medicine with their subordinate district veterinary hospitals, districts, polyclinics, state veterinary laboratories, and laboratories of veterinary-sanitary expertise at markets;—e) institutions of state veterinary medicine for all types of transportation;—f) state veterinary service on frontiers with its subordinate veterinary border checkpoints.

The organizational structure and number of employees in the network of state veterinary medicine are defined by the Main Administration of Veterinary Medicine with the State Veterinary Inspectorate of the Ukrainian Ministry of Agriculture and Foodstuffs and Crimean Republic Administration for State Veterinary Medicine.

Organization of work, rights and duties of state veterinary medicine are spelled out in this Law, the Statute for Veterinary Medicine of the Ukraine and other legislation.

Administrative agencies of state veterinary medicine are subordinated to the respective oblast, city and rayon state administrations and superior agencies of state veterinary medicine in matters within their competence.

Article 10. State Veterinary Medicine Administrative Agencies

Veterinary medicine is administered by the Main Administration of Veterinary Medicine, along with the State Veterinary Inspectorate of the Ukrainian Ministry of Agriculture and Foodstuffs, which is under the direct jurisdiction of the minister of agriculture and foodstuffs of the Ukraine. The Main Administration is headed by the chief state inspector of veterinary medicine of the Ukraine, which is appointed to this post by the Ukrainian Cabinet of Ministers. The statute concerning the Main Administration is ratified by the government of the Ukraine.

The chief state veterinary inspector of the Ukraine dealing with issues of state veterinary control is under the direct jurisdiction of the Ukrainian Cabinet of Ministers.

Agencies and institutions of state veterinary medicine implement inspectorial oversight of their serviced territory, regardless of the agency to which they are subordinated, in accordance with the statute on state veterinary oversight.

Management of veterinary medicine in the republic of Crimea is implemented by the Crimean republic administration for state veterinary medicine. This administration is headed by a chief who is appointed by the Main

Administration for Veterinary Medicine and State Veterinary Inspectorate of the Ukrainian Ministry of Agriculture and Foodstuffs.

Management of veterinary medicine in oblasts and cities of Kiev and Sevastopol is implemented by the relevant oblast, Kiev and Sevastopol municipal administrations of state veterinary medicine. The oblast, Kiev and Sevastopol municipal administrations are headed by chiefs appointed by the Main Administration of Veterinary Medicine and State Veterinary Inspectorate of the Ukrainian Ministry of Agriculture and Foodstuffs as coordinated with local state administration agencies.

Management of veterinary medicine in regions, cities and municipal rayons is implemented by the relevant regional, municipal and rayon enterprises (hospitals) of veterinary medicine. These enterprises (hospitals) are headed by chiefs who are also chief veterinarians of the regions, cities and municipal rayons, and are appointed by the chief of the Crimean republic or oblast, Kiev and Sevastopol municipal administrations of state veterinary medicine by agreement with local state administration agencies.

State veterinary medicine services on the railroads, in transportation and veterinary border checkpoints are headed by a chief appointed by the Main Administration of Veterinary Medicine and State Veterinary Inspectorate of the Ukrainian Ministry of Agriculture and Foodstuffs.

Administrators of agencies of state veterinary medicine in the Ukraine, Crimean republic, oblasts, regions, cities, railroads, transportation and border checkpoints are also chief state inspectors of veterinary medicine of the Ukraine, Crimean Republic, oblast, region, city, municipal rayon, railroad, transportation and border checkpoint, respectively. Deputy chiefs of agencies of state veterinary medicine are deputies of the corresponding chief state inspectors of veterinary medicine.

Article 11. Entrepreneurial Veterinary Practice

Legal or physical entities may be engaged in entrepreneurial veterinary practice provided they obtain special permission (license), which is issued by the Ukrainian Main Administration of State Veterinary Medicine, Crimean republic, oblast administrations of state veterinary medicine.

Regardless of the form of property at which veterinary specialists work, the ministries, agencies, enterprises, institutions and organizations, collective or other types of farms are governed in their work by the present Law, the Ukrainian Statute for Veterinary Medicine, and other standard-setting documents.

Section 4. Competence of Agencies of State Veterinary Medicine

Article 12. Legislation on Veterinary Medicine

The legislation concerning veterinary medicine consists of the Constitution of the Ukraine, the present Law, Ukrainian State on Veterinary Medicine and other legislative documents.

The regulations for veterinary medicine published by state veterinary medicine administrative agencies within the limits of their competence are mandatory for all state agencies, as well as enterprises, organizations and institutions, officials and citizens.

It is mandatory to publish documents regulating the practice of veterinary medicine.

Article 13. Competence of State Veterinary Medicine Agencies

The following are within the competence of state veterinary medicine agencies:—control and organization of steps for prevention, detection, treatment and eradication of infectious, invasive and noncommunicable animal diseases;—assessment of epizootic situations and issuance of mandatory orders for prevention and eradication of communicable diseases, as well as extermination of rodents, disinfection and other steps;—control over production of high-quality, from the veterinary and sanitary points of view, products and raw materials of animal origin;—implementation of veterinary-sanitary expertise of livestock and plant products at markets;—protection, along with public health agencies, of the public against diseases common to man and animals, and mutual exchange of information;—control over protection of the territory of the Ukraine against importation from other states of infectious animal diseases, as well as inspection of veterinary status of exported and imported animals, raw materials, products of animal origin, and feed;—assessment of veterinary-sanitary condition of meat processing and dairy enterprises, slaughterhouses, shops, livestock farms, fairs, markets, facilities for storage of raw materials and products of animal origin, feed and means of their transportation;—analysis of causes of noncommunicable diseases and death of animals and fowl, elaboration of recommendations to prevent them;—exclusive right to carry out veterinary-sanitary expertise on meat and slaughter products and meat processing and packing plants, slaughterhouses, shops and other processing enterprises and markets, and inspection of animals prior to slaughtering;—veterinary-sanitary and ecological monitoring of foodstuffs of animal and plant origin;—control and coordination of work of the veterinary agency service and specialists in veterinary medicine;—issuing conclusions to insurance agencies concerning animals that had to be killed or that died;—expert evaluation of drafts of plans and construction of livestock farms, structures, enterprises for slaughtering and processing animals and raw materials of animal origin, drafts of plans to allocate land for all types of above-mentioned construction and supply of water for livestock;—participation with workers and state commissions in receiving and starting up newly built livestock structures and slaughtering enterprises, processing animals and raw materials of animal origin;—imposition of a ban on operation or temporary cessation of operation of livestock facilities, enterprises for slaughtering and processing animals and raw materials of animal origin in the case of infraction of veterinary standards and regulations;—execution of clinical

laboratory (virological, bacteriological, chemical and toxicological, pathological, histological, parasitological, radiological, and other) tests in order to diagnose animal diseases, assess products and raw materials of animal origin, feed and water.

The following are within the exclusive competence of the Main Administration for Veterinary Medicine:—issuing conclusions about new veterinary agents, instruments, equipment, feed supplements, and ratification of standards and specifications for them;—implementation of control of production and use of biological, chemical, pharmaceutical feed supplements and other agents produced in the state or imported, which are intended for veterinary medicine, evaluation of their effect on animals and quality of products of animal origin, development and ratification of standards for their production and use.

Article 14. Rights of Agencies and Officials of State Veterinary Medicine

Officials in state veterinary medicine have the following rights:—to visit freely facilities within the area they service, request information needed to determine the epizootic situation, find causes of animal diseases and assess the veterinary-sanitary quality of products and raw materials of animal origin;—to issue mandatory orders to carry out epizootic-control and veterinary-sanitary measures;—to issue orders to slaughter animals, decontaminate products and raw materials of animal origin, processing or utilization thereof if communicable diseases are present or onset of a particularly dangerous animal disease is suspected;—to ban the use of products of animal origin that do not conform to veterinary-sanitary requirements, as well as to ban the processing of raw materials of animal origin;—to ban construction or reconstruction of livestock buildings, meat processing and packing plants, shops, warehouse and other structures that do not conform to veterinary-sanitary requirements;—to impose administrative fines upon officials and other individuals for infraction of this Law, regulations for animal quarantine and other veterinary-sanitary requirements.

It is forbidden to divert veterinary specialists to perform duties unrelated to veterinary services, with the exception of instances stipulated in current legislation.

No other circumstances or orders from officials can serve as grounds for some illegal action or idleness of veterinary specialists or workers.

Article 15. Authority of Agencies of Local Government, Local Agencies of State Executive Power in the Area of Veterinary Medicine

The authority of local government, local agencies of state executive power in the area of veterinary medicine includes the following, in accordance with legislation:—establishment and repeal of quarantine, special conditions and modes of farm work directed toward localization and eradication of animal diseases in the relevant

territories, farms and gardens;—organization of oversight of sanitary condition of the environment in the zone of activity of livestock farms, complexes, other enterprises processing products and raw materials of animal origin, implementation of steps to prevent infectious diseases of animals, epizootics and their eradication, taking steps to reduce loss of livestock, and animal products due to disease, death and diminished quality;—collaboration in establishment and development of enterprises producing agents used in veterinary medicine, repair and acquisition of spare parts, fuel, lubricants and vehicles for administrative agencies, institutions and specialists in state and departmental veterinary medicine;—issue orders dealing with organization of preventive measures against different dangerous animal diseases and their control.

Section 5. State Veterinary Control

Article 16. Officials Engaged in State Veterinary Control

Organization and implementation of state veterinary control are the tasks for chief state veterinary inspectors, their deputies and state veterinary inspectors.

Veterinary control of facilities of the Ukrainian Ministry of Defense, Ukrainian Ministry of Internal Affairs, Ukrainian Security Service, Border Troops, and Ukrainian National Guard is implemented by agencies of veterinary medicine of these ministries and agencies.

The chief state veterinary inspector of the Ukraine may grant the authority of state inspectors of veterinary medicine to other administrators and specialists in veterinary medicine.

Article 17. Control of Quality of Veterinary Preparations

State veterinary agencies control the use of veterinary agents; they also check storage and decontamination of such agents.

It is forbidden to use drugs, special feed supplements, trace elements, vaccines, other biologicals and reagents that are not registered in the pharmacopoeia or pharmacological service, or which are manufactured with flawed documentation as to standards or infraction of application rules.

It is also forbidden to use biological stimulators and hormones with thyrostatic, estrogenic, androgenic or gestagenic action for the purpose of accelerating growth and augmenting productivity (lactation) of cattle.

Article 18. State Veterinary Control in Markets

State veterinary control is mandatory in markets and other places where trade in animals, products and raw materials of animal and plant origin is organized. The owners of such wares must provide the appropriate conditions for the work of veterinary specialists.

Laboratories for veterinary-sanitary expertise in markets have a stamp for meat, labels indicating product quality, logs for records and other documents as stipulated in legislation concerning veterinary medicine.

The physician in a laboratory of veterinary-sanitary expertise in a market has the right to detain products deemed unfit for human consumptions. The owners of the markets must send such products for utilization or processing.

Article 19. State Veterinary Control of Hunting for Game

Each hunting society, organization or association must equip the areas where game is processed in accordance with veterinary-sanitary requirements and provide for veterinary-sanitary expertise of game that is to be consumed.

Article 20. Guarantees of Performance of Individuals Involved in State Veterinary Control

Specialists involved in state veterinary control are independent, and they are governed by this Law, the Ukrainian Statute on Veterinary Medicine, and other standards pertaining to veterinary medicine. State executive-administrative agencies, chiefs of enterprises, institutions, organizations, associations of citizens, and the public must cooperate with veterinary specialists in carrying out their professional duties. Officials of state agencies, enterprises, institutions, and organizations, regardless of form of property, and citizens who obstruct the legal activities of veterinary specialists are answerable in accordance with legislation.

Article 21. Duties of Legal and Physical Entities Whose Work Is Related to Production, Processing, Storage, Transportation and Trade in Animals, Raw Materials and Products of Animal Origin

Legal and physical entities the work of which is related to production, processing, storage, transportation and trade in animals, raw materials and products of animal origin must do the following:—safeguard animal health and make sure products and raw materials of animal origin are of a high quality in veterinary and sanitary respects;—implement technological, zoohygienic and other regulations of veterinary medicine;—immediately inform state veterinary agencies of onset of diseases of animals, their death or unusual behavior;—fulfill the demands of veterinary specialists, cooperate in establishing quarantines, restrictive and other veterinary measures;—deliver or submit animals for veterinary examination, preventive and therapeutic treatment, tests, inoculations, see that they are reliably immobilized during procedures, and also submit livestock and plant-growing products for veterinary-sanitary expertise;—cooperate with veterinary specialists in performing their tasks.

The appropriate state agencies, enterprises, institutions and organizations, legal and physical entities whose work is related to production, processing, storage, transportation and trade in animals, raw materials and products of animal origin must furnish free of charge work space, the necessary

office and communication equipment to management bodies and institutions of state veterinary medicine (including those at railroads, on water and air transport, border veterinary checkpoints, customs offices, branches of agency veterinary militia, laboratories of veterinary-sanitary expertise, markets, etc.), and reimburse them for expenses incurred to operate and rent such facilities.

Article 22. Responsibility for Infraction of Existing Legislation on Veterinary Medicine

Citizens and officials guilty of breaking the rules for animal quarantine, other veterinary-sanitary requirements, as well as individuals engaged in illegal veterinary pharmaceutical activities, are prosecuted in accordance with Ukrainian legislation.

Legal entities bear responsibilities stipulated in Ukrainian legislation.

Thirty percent of the administrative fines imposed by state veterinary inspectors is reserved for mandatory insurance of veterinary specialists as stipulated in Article 7 of this Law.

Article 23. Right of State Veterinary Inspectors to Impose Administrative Claims

In accordance with the procedure described in current legislation, state veterinary inspectors can impose the following fines:—chief state veterinary inspector of the Ukraine and his deputies: fines amounting to a maximum of the minimum wage for citizens and up to six times the minimum wage for officials;—chief state veterinary inspectors of the Crimean Republic, oblasts and cities of Kiev and Sevastopol, chief state veterinary inspector in transportation and state borders, and their deputies: fines for civilians up to half the minimum wage and for officials, up to four times the minimum wage;—chief state veterinary inspectors of cities, regions, railroads, transportation and border checkpoints: fines up to half the minimum wage for citizens and up to three times the minimum wage for officials;—heads of district state veterinary hospitals, veterinary districts, chiefs of oversight at disinfection and inoculation stations and centers, heads of laboratories of veterinary-sanitary expertise in markets: fines for citizens up to half the minimum wage and for officials up to twice the minimum wage.

Officials of state veterinary agencies can collect fines from citizens locally when they amount to a maximum of half the minimum wage and from officials up to the minimum wage.

Section 6. Council on Problems of Veterinary Medicine, Pharmacological Commission, and Extraordinary Epizootic-Control Commissions

Article 24. Council on Problems of Veterinary Medicine

A council on problems of veterinary medicine is being established under the Main Administration of Veterinary Medicine with the State Veterinary Inspectorate of the Ukrainian Ministry of Agriculture and Foodstuffs,

for the purpose of examining the most important problems of veterinary medicine. The council consists of specialists of the Main Administration, heads of state veterinary agencies in the Crimean Republic, oblasts, scientific research institutes of veterinary science and departments of veterinary medicine at educational institutions, prominent scientists in relevant fields (specialties) of state veterinary medicine, and members of the Association of Ukrainian Veterinary Specialists. Representatives of the Ukrainian Ministry of Health, other ministries and agencies of the Ukraine may also be members of this council.

The statute dealing with this council is ratified by the chief inspector of state veterinary medicine of the Ukraine.

Article 25. Pharmacological Commission of Veterinary Medicine

There is a pharmacological commission under the Main Administration of Veterinary Medicine and State Veterinary Inspectorate of the Ukrainian Ministry of Agriculture and Foodstuffs.

The pharmacological commission carries out expert evaluation of the efficacy of agents used in veterinary medicine, enters them in the state register, and issues appropriate certificates.

The statute concerning the pharmacological commission is ratified by the Main Administration of Veterinary Medicine along with the State Veterinary Inspectorate of the Ukrainian Ministry of Agriculture and Foodstuffs.

Article 26. Extraordinary Epizootic-Control Commissions

The Ukrainian Cabinet of Ministers forms extraordinary epizootic-control commissions for ongoing management and coordination of the work of enterprises and citizens on prevention and eradication of mass-scale animal diseases or poisoning.

The statute on extraordinary epizootic-control commissions is ratified by the Ukrainian Cabinet of Ministers.

Section 7. Financing, Material and Technical Support of State Veterinary Agencies and Institutions

Article 27. Financing and Material-Technical Support of State Veterinary Agencies and Institutions

Financing and material-technical support of state agencies and institutions of veterinary medicine are provided at the expense of the state and local budgets, as well as nonbudgetary resources.

The following are the nonbudgetary sources of financing the operation of state veterinary institutions and wages

of their employees:—payments from enterprises, institutions, organizations and citizens for completion of contractual work and paid services;—voluntary contributions from enterprises, institutions, public organizations, funds and citizens;—other sources that are not prohibited by law.

Article 28. Financing of Epizootic-Control Measures

The relevant budgeted resources and insurance premium deductions provide the financing for measures to prevent and eradicate infectious diseases of animals, diagnostic laboratory and radiological tests on foodstuffs and raw materials (in accordance with the list approved by the Ukrainian government), other veterinary-sanitary, epizootic-control measures, as well as emergency treatment in cases where animals' lives are at risk.

Article 29. Financing of Other Veterinary Measures

Payments according to prevailing rates are made for measures to prevent and eradicate animal diseases (other than those indicated in Article 28 of this Law), treatment of sick animals, laboratory tests, veterinary-sanitary expertise of livestock products, raw materials and all types of marketed products.

Article 30. International Relations

When international agreements with the Ukraine establish regulations other than those contained in this Law, the regulations in the international agreement apply.

©"Veterinariya", 1993

Law of the Republic of Kyrgyzstan on Veterinary Medicine

937C0269A Moscow *VETERINARIYA* in Russian No 3, 93 (Signed to press 18 Feb 93) pp 3-6

[Text] Publication of the Ukrainian law "On Veterinary Medicine" elicited considerable interest in the veterinary community and among specialists. The editor's office continues to acquaint readers with new veterinary laws approved in CIS countries.

The law of the Republic of Kyrgyzstan "On Veterinary Medicine" is offered for your attention below.

This law determines the general legal, economic, social and organizational principles of veterinary affairs in the interests of protecting the health of animals and preventing diseases common to animals and man.

Article 1. Veterinary Affairs

Veterinary affairs are a complex of state, public, economic and special measures to protect animals from infectious and noninfectious diseases and to treat them, to support production of good quality livestock products, to keep people from getting diseases inherent to animals and man, and to solve veterinary and public health problems of environmental protection.

Veterinary activity shall be carried on by the state veterinary service under the Ministry of Agriculture of the Republic of Kyrgyzstan, as well as by departmental veterinary services of other ministries, institutions, organizations and enterprises, and by specialists in private veterinary practice.

Article 2. Veterinary Legislation

Veterinary legislation of the Republic of Kyrgyzstan shall consist of this Law, other laws of the Republic of Kyrgyzstan, edicts of the President, Government decrees and normative acts of the republic state veterinary body under the Ministry of Agriculture, published in accordance with such edicts, which are also binding upon all ministers, enterprises, organizations and institutions regardless of their subordination and form of ownership, as well as upon officials and citizens.

Article 3. Organization of Veterinary Affairs

Veterinary affairs shall be organized in the Republic of Kyrgyzstan by the republic's Ministry of Agriculture.

Leadership over veterinary affairs and fulfillment of the Law as well as other legislative acts pertaining to veterinary medicine shall be exercised by the Ministry of Agriculture of the Republic of Kyrgyzstan in the person of a special body created within it.

Article 4. Bodies of State Veterinary Medicine

Bodies of state veterinary medicine of the Republic of Kyrgyzstan shall include veterinary administrative bodies under the Ministry of Agriculture, comprising a single system including republic, oblast, city and section veterinary bodies, as well as veterinary transport services and veterinary services at the state border.

Article 5. Competency of Bodies of State Veterinary Medicine

The following shall be within the competency of bodies of state veterinary medicine:

organizing the veterinary service and providing leadership to it within the republic;

protecting the territory of the Republic of Kyrgyzstan from import of agents of infectious animal diseases from other states;

adopting normative acts pertaining to veterinary issues;

drawing up programs to prevent import and spread of agents of infectious animal diseases, and eliminating the consequences of emergency situations brought on by epizootics and by natural and ecological disasters;

submitting documents to government bodies for enactment, lifting quarantines or special restrictions on economic activity directed at controlling infectious animal diseases, and in emergency situations;

providing for coordination with bodies of veterinary medicine of other ministries in organizing unified supervision and implementation of preventive measures, as well as with bodies of state public health supervision in regard to prevention and control of diseases common to animals and man;

maintaining state supervision over the veterinary condition of places of maintenance of farm animals, animal drive routes and livestock product processing enterprises, and over shipments of animals, livestock products and feed;

monitoring production of pharmaceuticals and biological preparations, registering imported preparations proposed for use in livestock farming, and conducting expert examinations of them;

issuing licenses (certificates) for the right to manufacture veterinary resources and to engage in private veterinary practice;

participating in the drafting of programs to train veterinary specialists and upgrade their qualifications;

determining the priority directions of scientific research in veterinary medicine jointly with scientific institutions;

representing the state's interests in veterinary medicine in international organizations and in cooperation with the veterinary services of foreign countries.

Article 6. Principal Tasks of State Veterinary Medicine

The principal tasks of state veterinary medicine shall be:

preventing and eliminating infectious diseases of animals (including birds, fur-bearing animals, bees and fish);

subjecting the maintenance, feeding and exploitation of animals, the procurement, processing, storage, use and transportation of livestock products and feed, and import, export and movement of farm animals (on foot and by vehicle) to veterinary monitoring;

conducting veterinary expert examination of trade in the products of livestock farming, beekeeping, and of fish and plant products, and maintaining supervision over the condition of places where such products are traded and of farm animals at markets, fairs and auctions;

organizing and implementing measures to protect animals from various diseases, as well as in emergency situations;

studying the patterns of appearance, course and spread of animal diseases, predicting their possible detection, and drawing up plans and systems for preventing and eliminating infectious diseases among farm animals and birds;

introducing regulations, the accomplishments of science and progressive experience into veterinary practice, and conducting public education.

Article 7. Bodies of State Veterinary Supervision (Inspectorates)

Bodies of state veterinary medicine under the Ministry of Agriculture shall concurrently be bodies of state veterinary supervision of the Republic of Kyrgyzstan.

The unified system of state veterinary supervision in the republic shall consist of republic, oblast, city and rayon state veterinary inspectorates and veterinary sections.

The statute on the state veterinary inspectorate shall be approved by the Government of the Republic of Kyrgyzstan.

Article 8. Officials Carrying on Veterinary Supervision

The organization and conduct of state veterinary supervision shall be assigned to the following officials:

the Chief State Veterinary Inspector of the Republic of Kyrgyzstan, who shall simultaneously serve as the director of the veterinary administrative body under the republic's Ministry of Agriculture, and who shall be subject to approval by the Government;

oblast chief state veterinary inspectors, who shall simultaneously serve as the directors of oblast veterinary administrative bodies under the Ministry of Agriculture, appointed by the republic's Chief State Veterinary Inspector with the consent of oblast bodies of executive government;

city and rayon chief state inspectors, who shall simultaneously serve as the directors of city and rayon veterinary administrative bodies, appointed by the republic's Chief State Veterinary Inspector with the consent of city and rayon bodies of executive government;

state section veterinary inspectors, who shall simultaneously serve as the directors of state veterinary sections, appointed by the rayon chief state veterinary inspector with the consent of bodies of local executive power;

the chief state veterinary inspector of the city of Bishkek, who shall simultaneously serve as the director of the veterinary supervisory body under the executive government of the city of Bishkek, appointed by the republic's Chief State Veterinary Inspector with the consent of the executive body of the city of Bishkek;

chief state veterinary inspectors shall have deputies, who shall be approved in accordance with the procedure established for chief state veterinary inspectors.

In addition to the positions they occupy, the directors of other veterinary structures under the Ministry of Agriculture shall simultaneously serve as state veterinary inspectors of the corresponding level.

Article 9. Basic Guarantees of the Activity of Persons Conducting State Veterinary Supervision

Officials of bodies of veterinary medicine under the Ministry of Agriculture conducting state veterinary supervision shall be independent in their activity, and they shall follow veterinary legislation.

Any form of influence whatsoever upon officials conducting veterinary inspection on the part of state bodies, officials, public organizations and citizens with the purpose of obstructing their lawful activity shall be punishable by law.

Bodies of state government and administration are obligated to render practical assistance to state veterinary inspectors in their performance of official duties, ensuring adoption of measures foreseen by law to punish persons preventing state veterinary inspectors from fulfilling their official functions.

Article 10. Obligations and Liability of Officials Conducting State Veterinary Supervision

Officials conducting state veterinary supervision are obligated to observe the Constitution, this Law and legislative acts of the Republic of Kyrgyzstan protecting the rights of enterprises, institutions, organizations and citizens.

Officials conducting state veterinary supervision who fail to fulfill their obligations shall be subjected to disciplinary, administrative and criminal punishment.

Unlawful actions by officials of state veterinary supervision shall be appealed in accordance with legislation of the Republic of Kyrgyzstan.

Article 11. The Right to Private Veterinary Practice

The right to engage in private veterinary practice is granted to persons possessing a higher or secondary veterinary education who have obtained a license (certificate) from the corresponding territorial administrative bodies under the Ministry of Agriculture. The procedure of issuing such licenses shall be determined by the Government of the Republic of Kyrgyzstan.

Article 12. Responsibilities of Owners of Animals and of Enterprises Processing Livestock Products

Owners of animals and of enterprises processing livestock products (regardless of their form of ownership) shall be obligated:

to implement economic and veterinary measures to prevent disease and death of animals, and produce good quality livestock products;

to present animals for inspection, diagnostic research, preventive immunizations and therapeutic and preventive processing at the demand of veterinary specialists, and to create conditions allowing for the implementation of special measures;

to not slaughter animals for food and for the sale of meat and other slaughtering products without the permission of veterinary specialists, and to not sell sick animals and ones suspected of having diseases;

in the event of sudden illness and unusual behavior of animals, to immediately isolate them and notify the veterinary service regarding this;

to carry out the prescriptions of the veterinary service pertaining to observance of veterinary regulations when quarantining animals suspected of harboring infectious diseases;

to maintain premises and structures for the storage and processing of products of animal origin in an appropriate veterinary condition.

Other obligations of the owners of animals and of enterprises processing livestock products may be established by republic legislation.

Article 13. Liability for Violating Veterinary Legislation

Persons guilty of violating veterinary legislation may be subjected to disciplinary, administrative or criminal punishment in accordance with laws of the Republic of Kyrgyzstan currently in force.

Article 14. Measures of Administrative Punishment Employed by State Veterinary Inspectors

State veterinary inspectors shall have the right to impose administrative fines upon persons guilty of violating quarantine conditions and other veterinary regulations, as well as decisions of government organs concerning control of infectious animal diseases.

Administrative fines shall be imposed:

by the Chief State Veterinary Inspector of the Republic of Kyrgyzstan and his deputies—in amounts up to 2,000 rubles;

by republic state veterinary inspectors and oblast chief state veterinary inspectors—in amounts up to R1,500;

by oblast state veterinary inspectors and by city and rayon chief state veterinary inspectors—in amounts up to R1,000;

by chief state veterinary inspectors of rail and air transport and by the chiefs of border veterinary control stations—in amounts up to R1,000;

by state veterinary inspectors of cities, rayons and sections, by the directors of veterinary expert examination laboratories at markets, and by chiefs of veterinary transportation sections—in amounts up to R600.

The procedure for imposing and collecting administrative fines for violation of veterinary legislation shall be regulated by the Republic of Kyrgyzstan's code of administration violations.

Article 15. Extraordinary Epizootic Control Commissions

Extraordinary epizootic control commissions operating in accordance with an approved statute on them shall be

created by the Government of the Republic of Kyrgyzstan and by oblast, city and rayon government organs for operational leadership and coordination of the activity of organizations, enterprises and citizens in preventing and eliminating widespread diseases and die-offs of animals.

Article 16. Quarantine

Quarantine is a system of organizational measures making it possible to prevent the spread of infectious diseases.

A quarantine shall be imposed upon individual herds, flocks, yards, commercial and other farms, population centers, rayons, cities and oblasts. The list of infectious animal diseases in relation to which a quarantine may be imposed shall be established by the Republic Veterinary Administrative Body under the Ministry of Agriculture.

A quarantine shall be imposed by decisions of the corresponding rayon, city and oblast government bodies or a decree of the Government of the Republic of Kyrgyzstan at the request of the territorial body of state veterinary medicine.

Article 17. Financing of Bodies of State Veterinary Medicine

Bodies of veterinary medicine under the Ministry of Agriculture carrying out the functions of state veterinary medicine shall be financed by republic and local budgets.

Financing of individual veterinary institutions providing veterinary services to the population and enterprises may be both by the budget and by other than budget assets received for work done.

Nonbudgetary assets shall not be considered when determining allocations from the budget, and budget allocations not utilized in the course of the year shall not be subject to confiscation.

Payments into the budget by bodies of state veterinary medicine shall not be established.

Measures to prevent the advent and spread of infectious animal diseases on a list approved by the supreme administrative body of state veterinary medicine under the Ministry of Agriculture and to control such diseases shall be implemented at the expense of republic and local budgets.

Article 18. International Agreements

If an international agreement of the Republic of Kyrgyzstan establishes regulations other than those contained in veterinary legislation, the regulations of the international agreement shall prevail.

[Signed] President of the Republic of Kyrgyzstan A. Akayev
Bishkek,
6 March 1992

New Radiopaque Material

937C0265A Kiev *KLINICHESKAYA KHIRURGIYA* in Russian No 3, 93 (manuscript received 15 Jun 92) pp 30-32

[Article by G.K. Katrashchuk, Yu.A. Krikun, V.I. Tkachenko, V.A. Yupenkov, and V.A. Gavriluk, X-Ray Diagnosis and X-Ray Therapy Department, Dnepropetrovsk Medical Institute; UDC 615.477.33]

[Abstract] A new radiopaque material has been proposed. The new material was developed on the basis of the anomalous effects of the interaction of x-radiation with media containing ultradisperse particles (under 1 μm in size) of selected metals and their oxides. Ultradisperse particles of tungsten powder were added to the silk threads used in surgical practice. The opacity of test specimens of silk and lavsan threads was compared with that of domestically produced surgical threads and the thread Micropac-600 (Courtauld's Research, Great Britain). The following filming regimen was used: 40 kV; 0.4 s; 2.5 mA; and focal distance, 38 cm. The following radiopacity values were found for the different threads tested (cd/m^2): kapron, 21.7; flax, 18.3; silk, 18.5; cat gut, 21.7; Micropac-600, 10.7; and tungsten powder-impregnated test thread, 26.3. The new tungsten-impregnated thread was found to have an optical density equivalent to that of a sheet of lead 0.2 mm thick and to be 1.8-2 times as dense as the English patented thread. Tests conducted on an RM-50 tensile testing machine established that the tungsten powder-impregnated material had a mechanical strength of 4.4 kg before testing and 4.1 kg after testing (versus pre- and posttest mechanical strength readings of 0.9 and 0.8 kg obtained for the Micropac-600). Tests of the effects of the new tungsten powder-impregnated material on the organs and tissues of white rats established that the new material retains its radiopacity for 6 months without any pathological effects on the tissues surrounding it. References 6 (Russian).

Uncoupling of Preganglionic Links and Implantation of Nerve Trunks as a Means of Activating Plasticity of Autonomic Neurons

937C0279B Minsk *VESTSI AKADEMII NAVUK SERYYA BIYALAGYCHNYKH NAVUK* in Russian No 5-6, 92 p 127

[Abstract of article by D. M. Golub and I. I. Novikov, UDC 611.83+616.833]

[Text] Two series of observations carried out in recent years are presented. In one series of experiments research was conducted on implantation of nerves in the wall of the common carotid and femoral arteries, into the submaxillary salivary gland and into the dorsal wall of the urinary bladder. It was established that regenerating nerves have an effect upon the plasticity of intraorganic neurocytes. In the other series the influence of uncoupling preganglionic links upon the neurons of autonomic ganglia is demonstrated. Decentralization of the cranial cervical ganglion caused an increase in the quantity of acetylcholinesterase-positive neurons on the operated side in comparison with the opposite side. Part of these nerve cells are characterized by elevated enzymatic activity. The indicated phenomena are interpreted as a possibility for stimulating plasticity of autonomic nerves by means of organopexy and implantation of nerve trunks.

Two figures, 12 bibliographic references.

COPYRIGHT: Vydavetstva "Navuka i tekhnika". Vestsi AN Belarusi, seryya biyalagychnykh navuk 1993

Computerized Television Image Processing in Clinical Assessment of Crystalline Lens

937C0243A Moscow *VESTNIK OFTALMOLOGII* in Russian No 1, Jan-Feb 93 (manuscript received 17 Nov 92) pp 18-21

[Article by G.S. Polunin, A.N. Gurov and A.K. Kasimov, Scientific Research Institute of Eye Diseases, Russian Academy of Medical Sciences, Moscow; UDC 617.741.-07:681.31]

[Abstract] A comparative study was made of methods used in estimation of crystalline lens density in 105 patients (23-78 years) with diabetes mellitus and absence or presence of opacity. The data yielded by reproductive microdensitometry and our computerized television image processing (CTIP) technique showed good correlation, demonstrating the clinical applicability of CTIP. In addition, while the former technique requires at least 1 h for completion, CTIP provides ready results in 10 min and can be used to predict cataract formation. An added advantage of CTIP is the capability of monitoring conjunctival vessels, disease processes and efficacy of therapy. Figures 4; references 8: 1 Russian, 7 Western.

END OF

FICHE

DATE FILMED

23 SEPT 1993